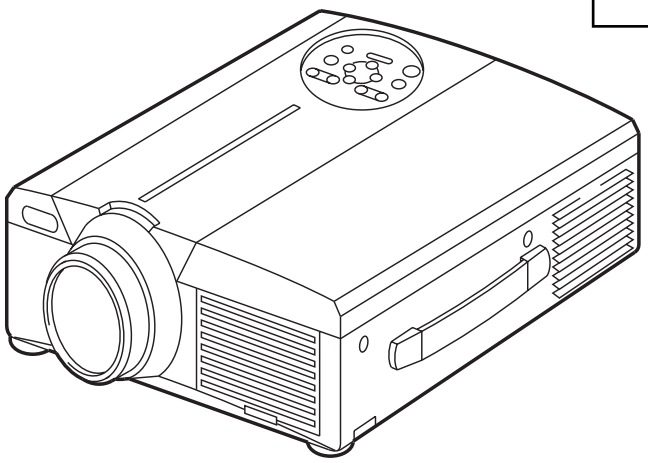
HITACHI

SERVICE MANUAL

SM0509

CPX980W
CPX985W
PJ1065



Caution

Be sure to read this manual before servicing. To assure safety from fire, electric shock, injury, harmful radiation and materials, various measures are provided in this Multimedia LCD Projector. Be sure to read cautionary items described in the manual to maintain safety before servicing.

Service Warning

1. When replacing the lamp, avoid burns to your fingers, the lamp becomes very hot.
2. Never touch the lamp bulb with a finger or anything else. Never drop it or give it a shock. They may cause bursting of the bulb.
3. This projector is provided with a high voltage circuit for the lamp. Do not touch the electric parts of power unit (main), when turning on the projector.
4. Do not touch the exhaust fan, during operation.
5. The LCD module assembly is likely to be damaged. If replacing the LCD module assembly, do not hold the FPC of the LCD module assembly.

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SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT.

Multimedia LCD Projector

April 2001 Digital Media Group

1. Features

- High brightness, High resolution
- Compact size, light weight for portability
- RGB output terminal
- RS-232C Communication
- Mouse emulation
- Power zoom and power focus functions
- Complies with VESA DDC1/2B specifications
- Auto-adjustment function

2. Specifications

Liquid crystal panel	Drive system		TFT active matrix
	Panel size		1.3 inches
	Number of pixels		1024 (H) × 768 (V)
Lamp			250W UHB
Video input	Composite Y/C	System	NTSC, 4.43NTSC, PAL, M-PAL, SECAM (N-PAL : only compulsion mode)
		Level	Composite 1.0Vp-p (75Ω termination) Y/C Y : 1.0Vp-p (75Ω termination) C : 0.286Vp-p (NTSC burst signal, 75Ω termination) 0.3Vp-p (PAL/SECAM burst signal, 75Ω termination)
	Component	System	480i, 480p, 575i, 720p, 1035i, 1080i
		Level	Y 1.0Vp-p (75Ω termination) Cb/Cr 0.7Vp-p (75Ω termination) Pb/Pr 1.0Vp-p (75Ω termination)
RGB	Digital input		Type T.M.D.S Video signal DC:150~1200mV, AC:1.56Vp-p Sync signal TTL level
	Analog input/output		Type R.G.B separate Video signal 0.7Vp-p (75Ω termination) Sync signal H/V separate or composite, TTL level
Audio	Input		200mVrms, 20kΩ or less
	Output		0~200mVrms, 1kΩ
Speaker output			1.2W + 1.2W (stereo)
Power supply			AC100~120V/4.5A, AC220~240V/2.2A
Power consumption			400W
Dimensions			289 (W) × 124 (H) × 350 (D) mm
Weight			6.4kg (14lbs)
Temperature range			Operation : 0~35°C Storage : -20~60°C
Accessories			Remote control transmitter × 1 RGB cable × 1 Video/Audio cable × 1 Mouse cable × 1 Component cable × 1 POWER cord × 3 BATTERIES LR6 × 2 Carrying case × 1 Quick start guide × 1 CD-ROM(User's guide) × 1

3. Names of each part

● Parts names

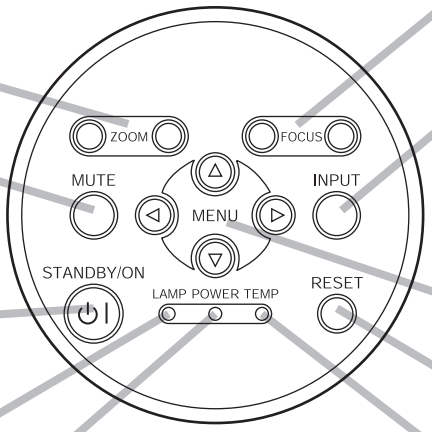
ZOOM Button
Used to adjust the size of the image.

MUTE Button
This button turns the sound on and off. Press once to turn the sound off; then press again to turn the sound back on.

STANDBY / ON Button
Press this button to turn the power on and off. When turned off, the projector enters standby status.

LAMP Indicator
This lamp lights or blinks when the lamp is off.

POWER Indicator
This indicator lights or blinks during standby and during operation.



Control Panel

FOCUS Button
Used to adjust the focus of the image on the screen.

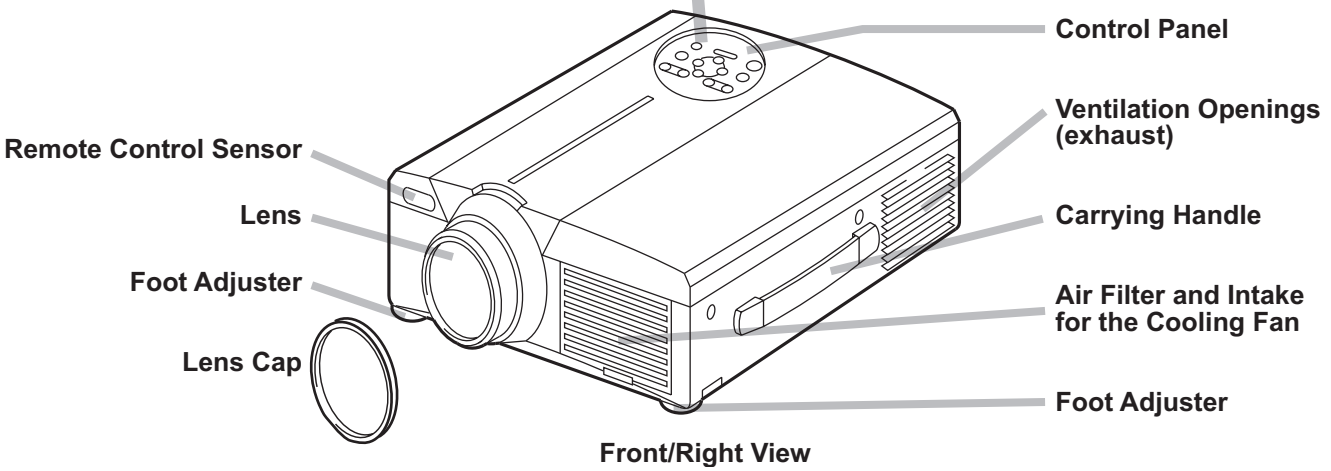
INPUT Button
Press this button to switch the input. The input changes in the following sequence each time this button is pressed.

RGB1 → RGB2 → DIGITAL
↑ ↓
COMPONENT ← S-VIDEO ← VIDEO

MENU Button
Displays the image menu.

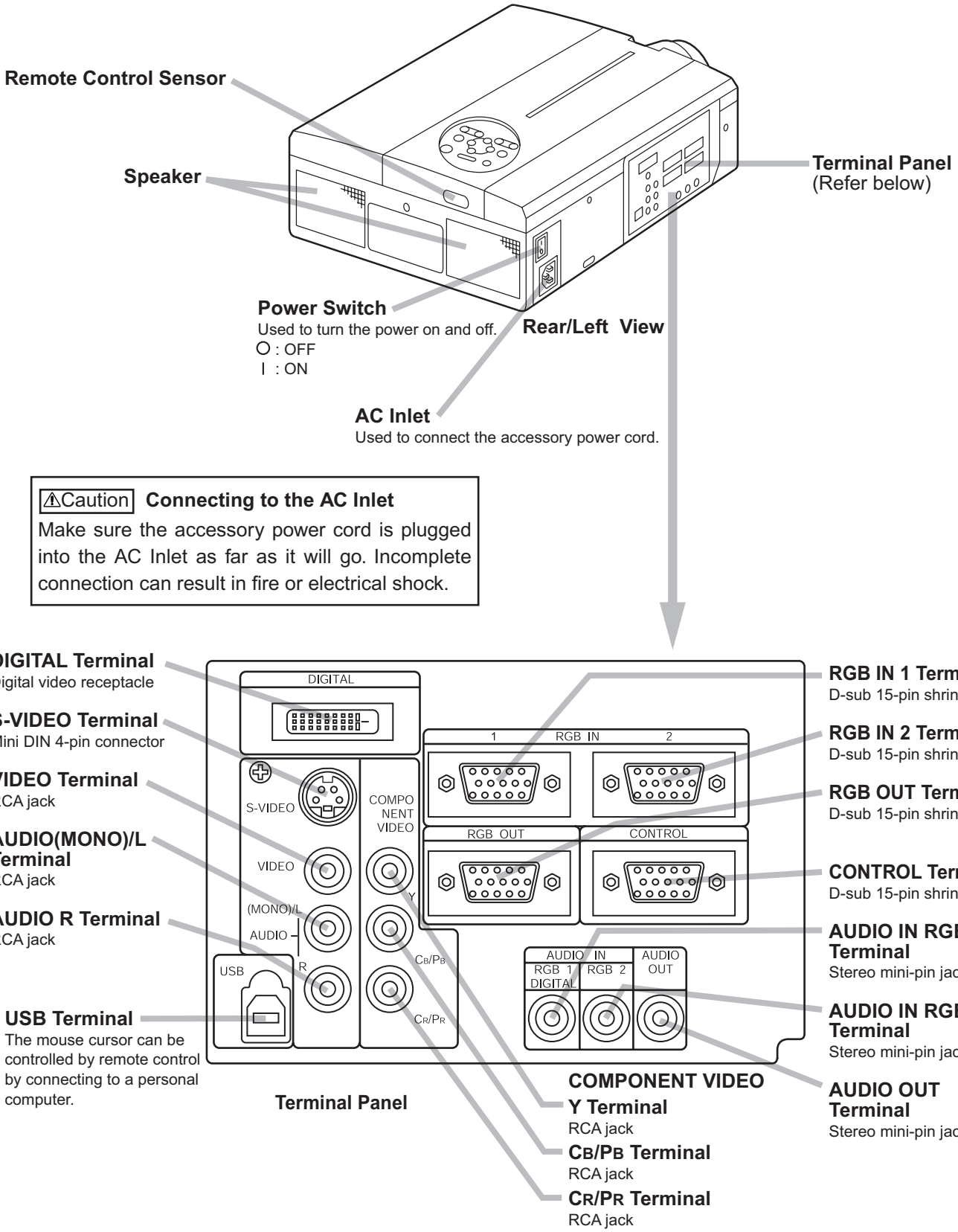
RESET Button
Used to reset the initial settings.

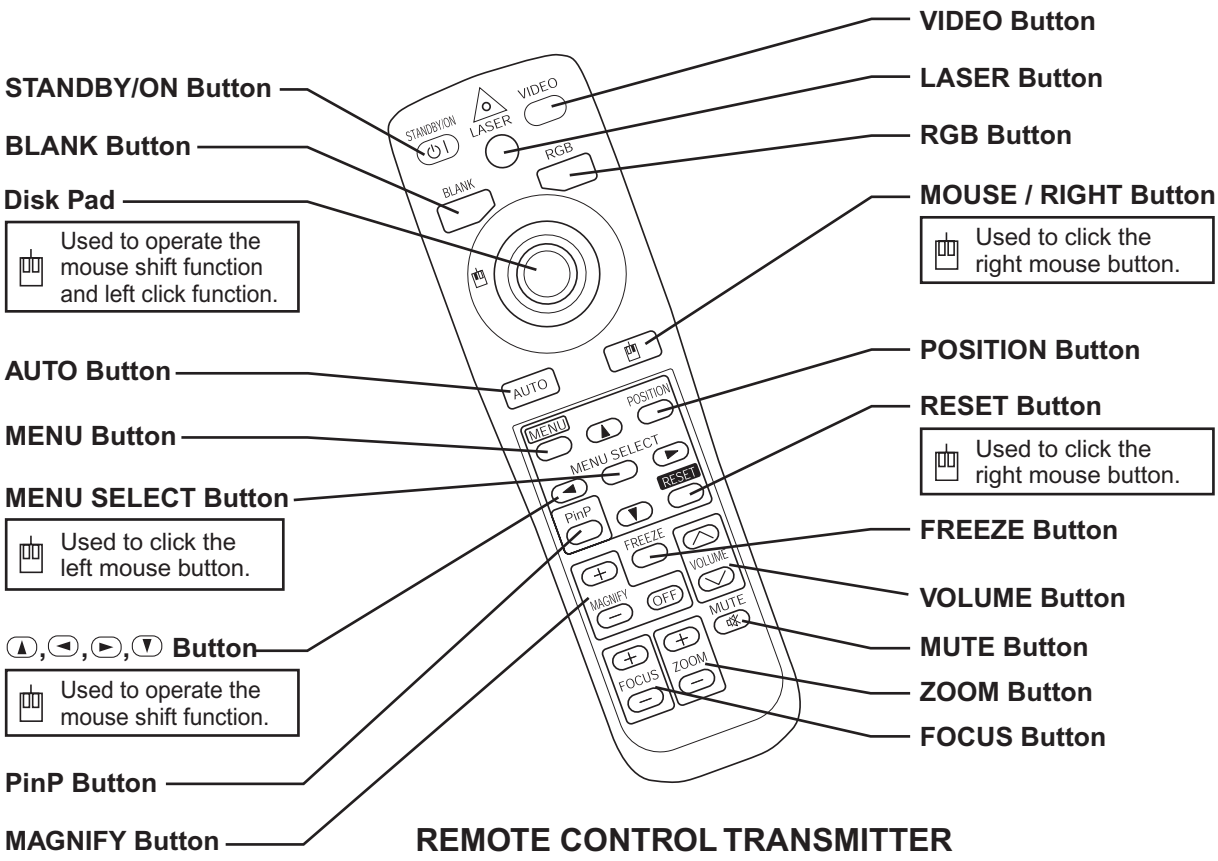
TEMP Indicator
This indicator lights or blinks when the internal temperature of the projector rises and when the fan malfunctions.



Front/Right View

- Use the remote control transmitter in front of the remote control sensor at a distance of about 5 m or less and an angle of 30 degrees to the left or right of the center.


Remote Control Sensor
Speaker
Terminal Panel
(Refer below)
Power Switch
Used to turn the power on and off.
O : OFF
I : ON
Rear/Left View
AC Inlet
Used to connect the accessory power cord.
⚠Caution Connecting to the AC Inlet
Make sure the accessory power cord is plugged into the AC Inlet as far as it will go. Incomplete connection can result in fire or electrical shock.
DIGITAL Terminal
Digital video receptacle
S-VIDEO Terminal
Mini DIN 4-pin connector
VIDEO Terminal
RCA jack
AUDIO(MONO)/L Terminal
RCA jack
AUDIO R Terminal
RCA jack
USB Terminal
The mouse cursor can be controlled by remote control by connecting to a personal computer.
DIGITAL
S-VIDEO
VIDEO
(MONO)/L
AUDIO
R
USB
COMPO NENT VIDEO
Y
CB/PB
CR/PR
1
RGB IN
2
RGB OUT
CONTROL
AUDIO IN
RGB 1 DIGITAL
RGB 2
AUDIO OUT
Terminal Panel
RGB IN 1 Terminal
D-sub 15-pin shrink
RGB IN 2 Terminal
D-sub 15-pin shrink
RGB OUT Terminal
D-sub 15-pin shrink
CONTROL Terminal
D-sub 15-pin shrink
AUDIO IN RGB1 Terminal
Stereo mini-pin jack
AUDIO IN RGB2 Terminal
Stereo mini-pin jack
AUDIO OUT Terminal
Stereo mini-pin jack
COMPONENT VIDEO
Y Terminal
RCA jack
CB/PB Terminal
RCA jack
CR/PR Terminal
RCA jack

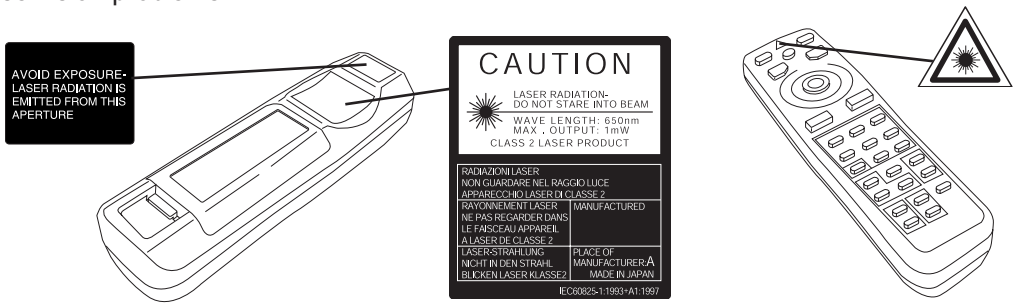


REMOTE CONTROL TRANSMITTER

: These functions works when the mouse control function is activated. Remember, the POSITION, BLANK ON and MENU ON functions disable the mouse control function.

WARNING

The laser pointer of the remote control transmitter is used in place of a finger or rod. Never look directly into the laser beam outlet or point the laser beam at other people. The laser beam can cause vision problems.



NOTE: To prevent any malfunction;

- Do not give the Remote control transmitter any physical impact. Take care not to drop.
- Do not place the heavy objects on the Remote control transmitter.
- Do not wet the Remote control transmitter or place it on any wet object.
- Do not place the Remote control transmitter close to the cooling fan of the projector.
- Do not disassemble the Remote control transmitter in case of malfunction. Please bring it to the service station.

Message table

On-screen display

The following messages are displayed on the screen.

"CHANGE THE LAMP" "AFTER REPLACING LAMP, RESET THE LAMP TIMER"	Lamp has 1,700 hours on it and may need to be changed.
"CHANGE THE LAMP" "AFTER REPLACING LAMP, RESET THE LAMP TIMER" "THE POWER WILL TURN OFF AFTER 20 Hr."	Lamp has 2,000 hours on it. See P.21 "Resetting the lamp timer"
Blinking of "CHANGE THE LAMP" "AFTER REPLACING LAMP, RESET THE LAMP TIMER" "THE POWER WILL TURN OFF AFTER 0 Hr."	When the lamp has 1,700 hours or more on it, the message will blink, and the power will turns off after 10 minutes.
"NO INPUT IS DETECTED"	Signal is not input.
"SYNC IS OUT OF RANGE"	The horizontal or vertical frequency of the input signal exceeds the range of the projector, it cannot be displayed.

Indicator display

The POWER indicator, LAMP indicator and TEMP indicator will light or blink in the following cases.

POWER indicator	LAMP indicator	TEMP indicator	Meaning	Remedy
Lights orange	Goes off	Goes off	Standby mode	————
Blinks green	Goes off	Goes off	During warming up	————
Lights green	Goes off	Goes off	During operation	————
Blinks orange	Goes off	Goes off	During cooling down	————
Lights red	Lights red	Goes off	Lamp cannot light	Cool projector by power off for 60 minutes. If the indicator is still lit, lamp may be defective. Replace.
Lights red	Blinks red	Goes off	Lamp is not inserted or lamp door is not closed.	Securely insert the lamp or close the lamp door.
Lights red	Goes off	Blinks red	Cooling fan accidented	Replace fan.

When inside temperature becomes high, to protect the projector, the lamp may be turned off and the lamp indicator lights red, or the projector will be shut down and the all indicator display goes off.

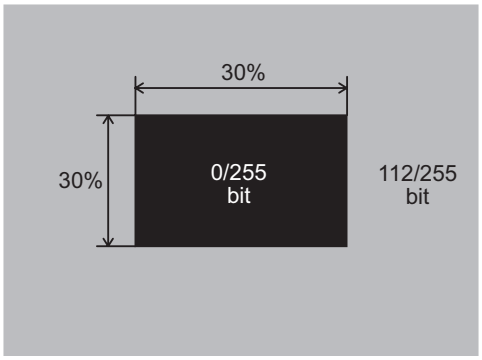
4. Adjustment

4 - 1 Before adjusting

1. Before starting adjustment, warm up the projector for about 10 minutes. (Blank white)
2. Set Zoom Wide to Max. and project an image a distance of more than 40 inches.
3. Normalizing the video adjustment.
   (Press the [MENU] button of the Remote control transmitter to display the Setup menu, then press the [RESET] button. And select the [DEFAULT].)
   *note : The setup menu is not displayed on with no signal.
4. Perform all adjustments from the Adjustment menu. Perform the following operations to display the Adjustment menu.
   a. Press the [MENU] button of the Remote control transmitter (the Setup menu will appear).
   b. Next, press the [RESET] button one time. And press the [RESET] button again for 5 seconds or more (the Adjustment menu will appear).

4 - 2 Ghost adjustment

Signals for internal adjustment

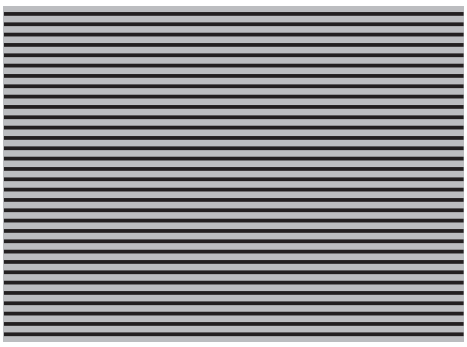


Adjustment procedure

1. Use DAC-P - GHOST - R: in the Adjustment menu to adjust so that R color ghost is at a minimum.
   (Set the adjustment value to 16, then raise the value. When a ghost appears to the left of a vertical line, reduce the value by 2 steps.)
2. In the same way, use DAC-P - GHOST-G: in the Adjustment menu to adjust so that G color ghost is at a minimum.
3. In the same way, use DAC-P - GHOST-B: in the Adjustment menu to adjust so that B color ghost is at a minimum.

4 - 3 Flicker adjustment (V.COM adjustment)

Signals for internal adjustment

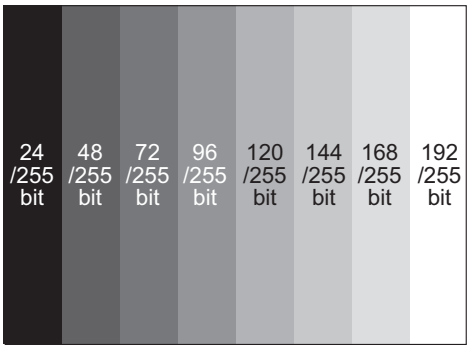


Adjustment procedure

1. Make this adjustment after completing the adjustment in 4-2 Ghost adjustment.
2. Use DAC-P - V.COM - R: in the Adjustment menu to adjust so that the flicker at the center of the screen is less than the flicker at the periphery.
   (When the flicker is about the same across the whole screen, adjust so that the flicker at the center of the screen is somewhat less than elsewhere.)
3. In the same way, use DAC-P - V.COM-G: in the Adjustment menu to adjust the G color flicker.
4. In the same way, use DAC-P - V.COM-B: in the Adjustment menu to adjust the B color flicker.

4 - 4 NRSH adjustment (vertical stripe adjustment)

Signals for internal adjustment



Adjustment procedure

1. Make this adjustment after completing the adjustment in 4-3 Flicker adjustment.
2. Use DAC-P - NRSH - R: in the Adjustment menu to adjust so that the vertical lines spaced every 12 dots are as inconspicuous as possible.
   (Reduce the adjustment value when black stripes appear in the 2nd or 3rd tone from the black side. Note that when the adjustment value is lowered, white stripes may appear in the 2nd or 3rd tone from the bright side. Should this happen, adjust so that the stripes are as inconspicuous as possible.)
3. In the same way, use DAC-P - NRSH - G: in the Adjustment menu to adjust vertical stripes of G color.
4. In the same way, use DAC-P - NRSH - B: in the Adjustment menu to adjust vertical stripes of B color.

4 - 5 White balance adjustment

Preparations

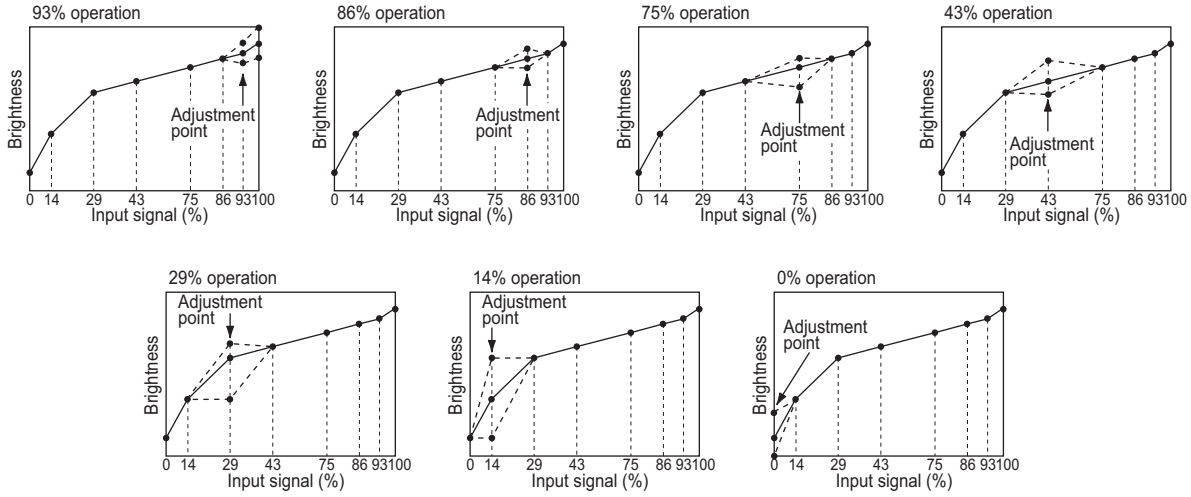
1. Perform these adjustment after the NRSH adjustment described in Section 4-4.
2. Reset gamma correction before adjustment.
   - Place the cursor on [GAMMA] in the Adjustment menu, press the [RESET] key and select [DEFAULT].
   - Now press the [RESET] key again and press the [MGNIFY-OFF] button of the Remote control transmitter for 5 seconds or more (the confirming to "MICRO" reset menu will appear).

Adjustment procedure

1. First, adjust the G color.
2. BRIGHT and CONTRAST set to MAX in the Setup menu.
3. Place the cursor on Slide Show in the Adjustment menu [A/D], press the [▶] key three times to display G monochrome and adjust the illuminance at the center of the screen. Make a note of the setting (here assumed to be A [lx]). Press the MENU key to return.
4. BRIGHT and CONTRAST is returned to default in the Setup menu.
5. Adjust Gamma, 93%, and G: in the Adjust menu so that illuminance (Y) at the center of the screen is adjusted as follows.
   Y = A x 0.84±2 [%]
6. Adjust Gamma, 86%, and G: in the Adjust menu so that illuminance (Y) at the center of the screen is adjusted as follows.
   Y = A x 0.71±2 [%]
7. Adjust Gamma, 75%, and G: in the Adjust menu so that illuminance (Y) at the center of the screen is adjusted as follows.
   Y = A x 0.53±2 [%]
8. Adjust Gamma, 43%, and G: in the Adjust menu so that illuminance (Y) at the center of the screen is adjusted as follows.
   Y = A x 0.155±2 [%]
9. Adjust Gamma, 29%, and G: in the Adjust menu so that illuminance (Y) at the center of the screen is adjusted as follows.
   Y = A x 0.0635±2 [%]
10. Adjust Gamma, 14%, and G: in the Adjust menu so that illuminance (Y) at the center of the screen is adjusted as follows.
    Y = A x 0.015±2 [%]

11. Before adjusting Gamma, 0%, and [G:], adjust Gamma, 0%, R: and B: so that the following values.
    [0%][R:] = -128
    [0%][B:] = -128
12. Adjust Gamma, 0%, and G: in the Adjust menu so that illuminance (Y) at the center of the screen is adjusted as follows.
    Y = A x 0.0055±2 [%]
    But adjustment value is set to [-68] ~ [0].
13. Now, adjust the R and B colors.
14. Place the cursor on [BLACK-REF] in the Adjustment menu [GAMMA]. Then measure the color coordinates at the center of the screen and take a note of the setting (here assumed to be x1, y1).
15. Adjust Gamma, 86%, R: and B: so that the color coordinates (x, y) at the center of the screen take on the following values.
    x = 0.282±0.001
    y = 0.340±0.002
16. Adjust Gamma, 93%, R: and B: so that the following values.
    [93%][R:] = [86%][R:]
    [93%][B:] = [86%][B:]
17. Adjust Gamma, 75%, R: and B: so that the color coordinates (x, y) at the center of the screen take on the following values.
    x = 0.282±0.001
    y = 0.340±0.002
18. Adjust Gamma, 43%, R: and B: so that the color coordinates (x, y) at the center of the screen take on the following values.
    x = 0.280±0.001
    y = 0.340±0.002
19. Adjust Gamma, 29%, R: and B: so that the color coordinates (x, y) at the center of the screen take on the following values.
    x = 0.275±0.001
    y = 0.333±0.002
20. Adjust Gamma, 14%, R: and B: so that the color coordinates (x, y) at the center of the screen take on the following values.
    x = 0.260±0.001
    y = 0.315±0.002
21. Adjust Gamma, 0%, R: and B: so that the color coordinates (x, y) at the center of the screen take on the following values.
    x = x1 + 0.005±0.001
    y = y1 + 0.005±0.002

Adjustment operations (reference)

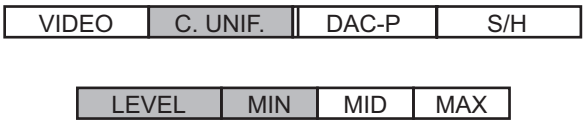


4 - 6 Color uniformity adjustment

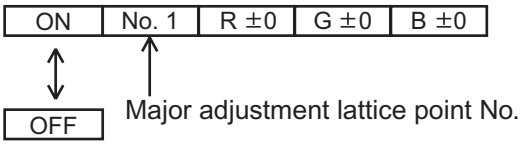
Preparations

1. Perform these adjustments after the white balance adjustment described in Section 4-5.
2. Make a color uniformity adjustment for the following three tones.
   - MIN tone (approx. 18% input signal)
   - MID tone (approx. 50% input signal)
   - MAX tone (approx. 75% input signal)
3. Place the cursor on the tone to be adjusted in the Adjust menu and press the [▼] key. This displays the Adjust Tone menu at the bottom of the screen. Select the major adjustment lattice point No. and color, then adjust them.
4. The major adjustment lattice point numbers (a total of 17 points) corresponds to the major adjustment lattice point positions in the diagram on the right.
   The color uniformity of the entire screen can be adjusted by adjusting the white balance for each of the points starting in order from the low numbers.
5. Adjustment point No.1 should not be adjusted, because it controls the brightness of the entire screen.
6. To temporarily turn correction off, place the cursor on "ON" in the Adjust Tone menu and press the [▼] key. To turn it on again, place the cursor on OFF in the Adjust Tone menu and press the [▲] key.
7. Although this adjustment can also be made using internal signals, we will here use the [MENU SELECT] key on the Remote control transmitter to select the following two signals.
   - Solid monochrome adjustment color (use G color adjustment when a color differential meter is used).
   - Solid white (use for adjustment other than above).
8. Reset color shading correction before adjustment.
   - When 3 tones and all colors are to be reset, place the cursor on [C.UNIF.] in the Adjustment menu, press the [RESET] key and select [DEFAULT].
   - When only 1 tone is to be reset, place the cursor on the tone to be reset, press the [RESET] key and select [DEFAULT].
   - Single tone and monochrome resets cannot be performed.

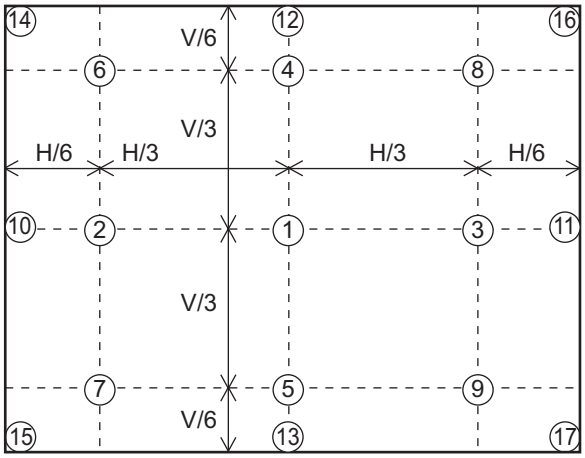
Adjust menu



Adjust Tone menu



Major adjustment lattice point position



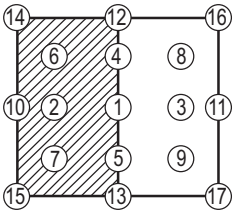
Adjustment procedure 1
(when a color differential meter is used)

1. First adjust [MIN] tone [G:].
   Unless there is conspicuous black uniformity, there is no need to adjust. (Go to step 10 if no adjustment is required.)
2. Select adjustment point [No.2][G:].
   When the background is [G] monochrome, press the [MENU SELECT] key on the Remote control transmitter to change to solid white.
3. Measure the color coordinates of adjustment point [No.1] and make a note of them.
   Assume that they are x = x1, y = y1.
   Note : When the CL-100 color and color difference meter is used, the [△](delta) mode is convenient. When adjustment point [No.1] color coordinate has been selected, set the slide switch on the side to [△](delta) while holding down the [F] button on the front panel. The measurement shown after this displays the deviation from measurement point 1.
4. Now measure the color coordinates of measurement point [No.2]. If the y of the color coordinates is more than±0.010, adjust [No.2] and [G:] so that the color coordinates are as follows.
   If y>y1+0.01,
   y=y1+0.01±0.01
   If y<y1-0.01,
   y=y1-0.01±0.01
   (Adjust y only)
5. Similarly, measure adjustment points [No.3] to [No.9] and adjust their color coordinates starting in order from the small number points.
6. Then measure the color coordinates for adjustment point [No.10]. If the y of the color coordinates is more than±0.020, adjust [No.10] and [G:] so that the color coordinates are as follows.
   If y>y1+0.02,
   y=y1+0.02±0.01
   If y<y1-0.02,
   y=y1-0.02±0.01
7. Similarly, measure adjustment points [No.10] to [No.17] and adjust their color coordinates starting in order from the small number points.
8. Then adjust [MIN] tone [R] and [B].
   Measure the color coordinates of measurement point [No.2] and adjust [No.2][R:] and [B:] so that the coordinates are as follows.
   x = x1±0.005 , y = y1±0.010
9. Similarly, measure adjustment points [No.3] to [No.17] and adjust their color coordinates starting in order from the small number points.
   This completes adjustments required for [MIN].
   Note : Since excessive correction may lead to a correction data overview during internal calculations, use the following values for reference.
   [No.2] to [No.5]±30 or less
   [No.6] to [No.9]±40 or less
   [No.10] to [No.13]±60 or less
10. Then adjust [MID] tone [G] so that the adjustment data are same as [MIN] tone [G].
    This completes [G] color adjustments.
11. Then adjust [MID] tone [R] and [B].
    Select [No.2] [B:] and press the [MENU SELECT] key on the Remote control transmitter to change to solid white.
12. Measure the color coordinates of adjustment point [No.1] and make a note of them.
    Assume that they are x = x1, y = y1.
13. Now measure the color coordinates of measurement point [No.2] and adjust [No.2][R:] and [B:] so that the coordinates are as follows.
    x = x1±0.005 , y = y1±0.010
14. Similarly, measure adjustment points [No.3] to [No.17] and adjust their color coordinates starting in order from the small number points.
    This completes [MID] tone adjustments.
15. Now make similar adjustments for [MAX] tone.
    (Adjust [MAX] tone [G] so that the adjustment data are same as [MIN] tone [G].)

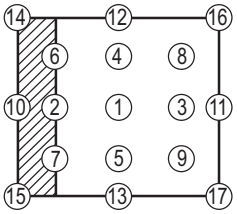
Adjustment procedure 2
(visual inspection)

1. First adjust [MIN] tone [G:].
   Unless there is conspicuous black shading, there is no need to adjust. (Go to step 9 if no adjustment is required.)
2. Select [No.2] [G:].
   If the background is [G] monochrome, press the [MENU SELECT] key on the Remote control transmitter to change to solid white.
3. View measurement point [No.2] and [No.3].
   Lower the [G] color intensity only of the color point whose [G] color is more intense than measurement point [No.1].
4. View measurement point [No.10] and [No.11].
   Lower the [G] color intensity only of the color point whose [G] color is more intense than measurement point [No.1], and raise the intensity of the point whose color intensity is lower than measurement point [No.1].
5. Now adjust the [MIN] tone for colors [R] and [B].
6. View measurement points [No.2], [No.3], [No.10] and [No.11]. Adjust the [R] and [B] of each measurement point so that they have the same color as measurement point [No.1].
   Adjustment technique:
   First, adjust [B:] of the point whose color is to be adjusted so that it approximates that of [No.1]. If [R:] is low at this time, the image will have cyan cast, in which case [R:] is increased. On the other hand, if [R:] is excessive, the image will have a magenta cast, in which case [R:] is decreased.
   Overall, a cyan cast makes it easy to see color shading.
7. Next, view measurement points [No.4], [No.5], [No.12], [No.13] and make similar adjustments.
8. Then adjust measurement points [No.6], [No.7], [No.8], [No.9], [No.14], [No.15], [No.16] and [No.17]. This completes the [MIN] tone adjustments.
9. Make similar [MID] tone and [MAX] tone as described in steps 1 to 8 above.

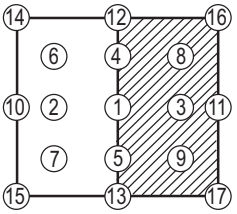
No. 2 deviation range



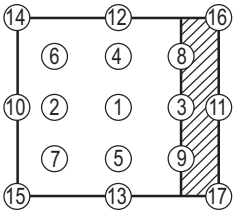
No. 10 deviation range



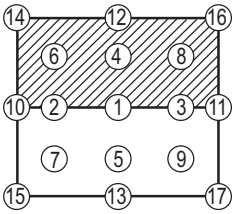
No. 3 deviation range



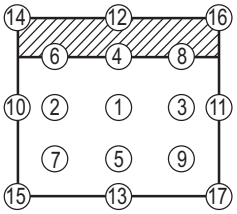
No. 11 deviation range



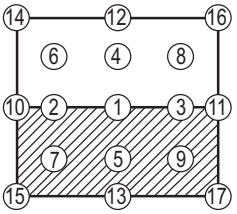
No. 4 deviation range



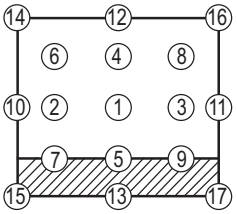
No. 12 deviation range



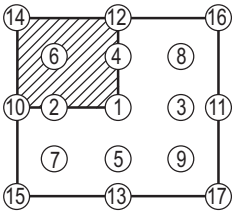
No. 5 deviation range



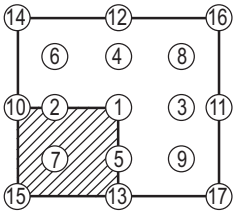
No. 13 deviation range



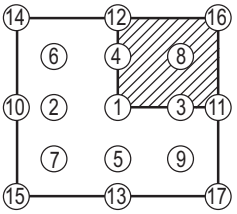
No. 6 deviation range



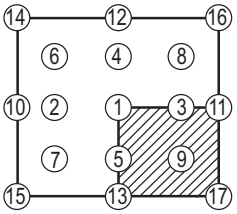
No. 7 deviation range



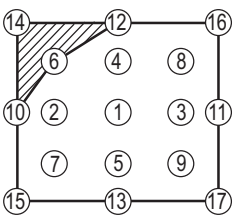
No. 8 deviation range



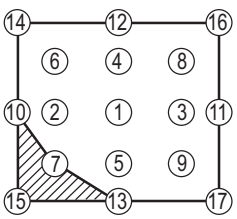
No. 9 deviation range



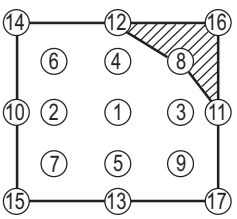
No. 14 deviation range



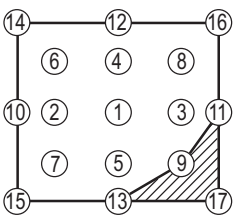
No. 15 deviation range



No. 16 deviation range

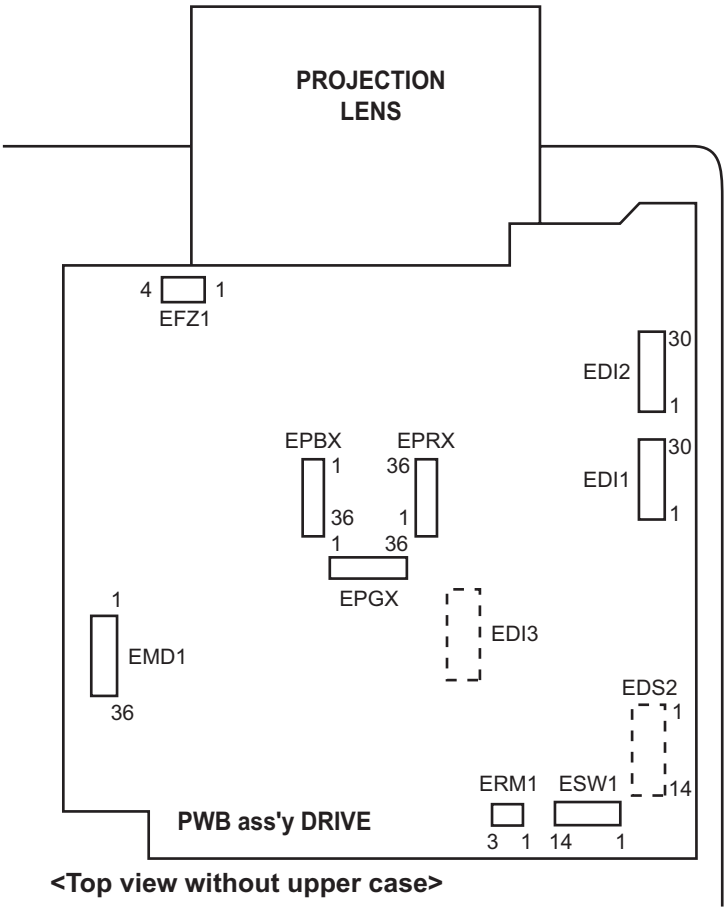


No. 17 deviation range



5. Troubleshooting

Check points at trouble shooting

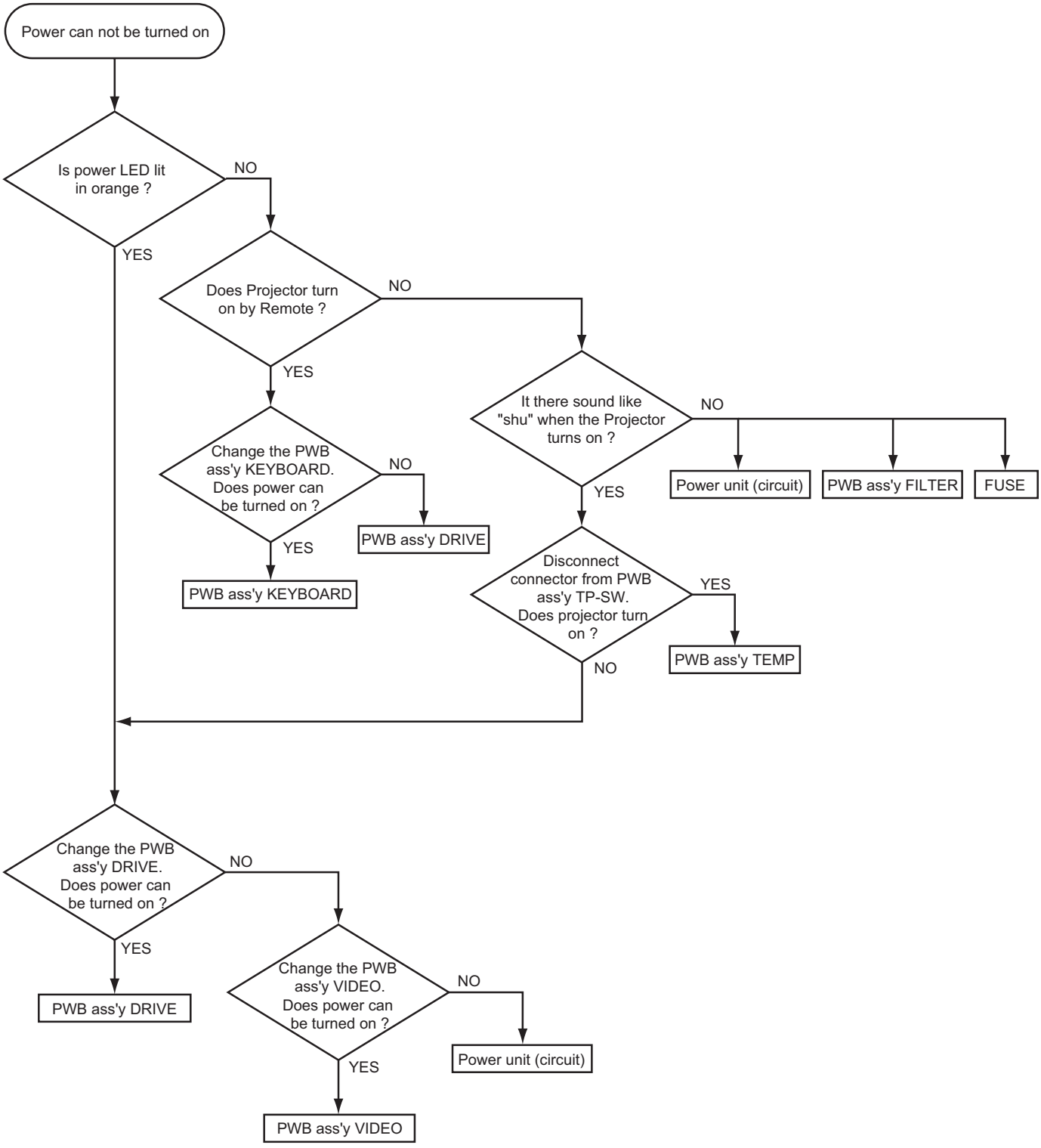


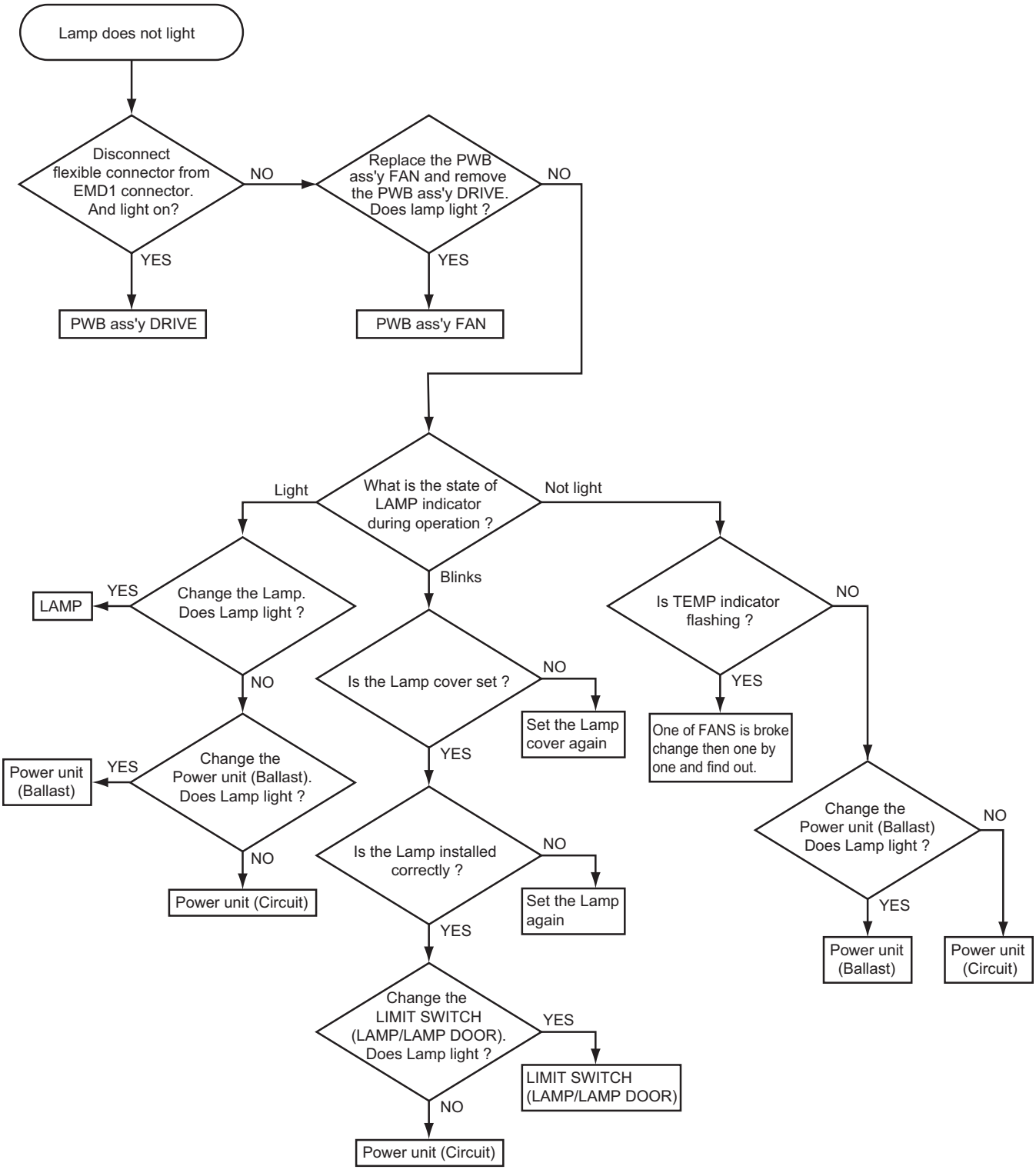
<Top view without upper case>

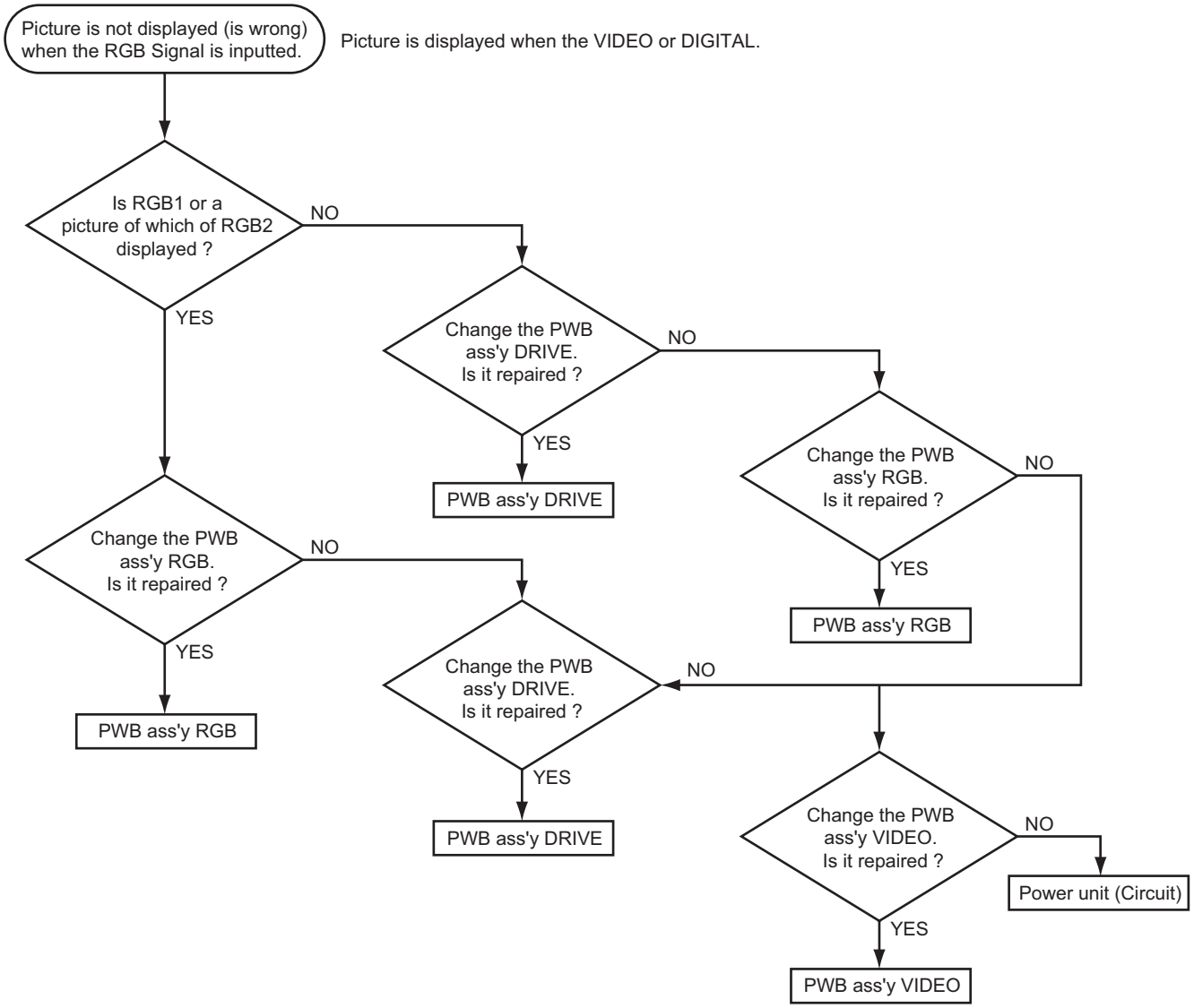
Connectors on the back side of PWB ass'y DRIVE are drawn by dotted line.

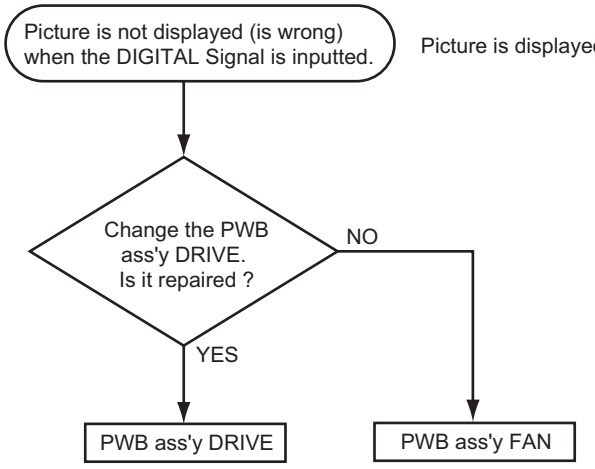
The power supply input of PWB ass'y DRIVE

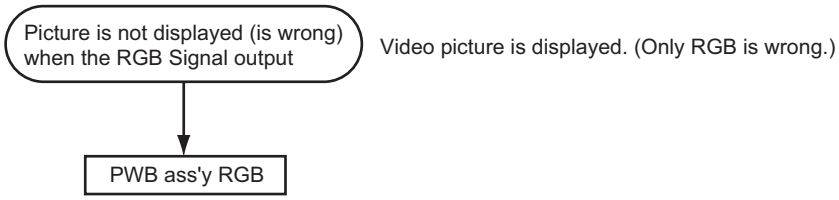
EDS2 Pin No.	Power supply voltage value
1	+9V
2	GND
3	+16.5V
4	GND
5	+5V
6	GND
7	+5V (standby)
8	GND
9	+4.3V
10	
11	
12	GND
13	
14	

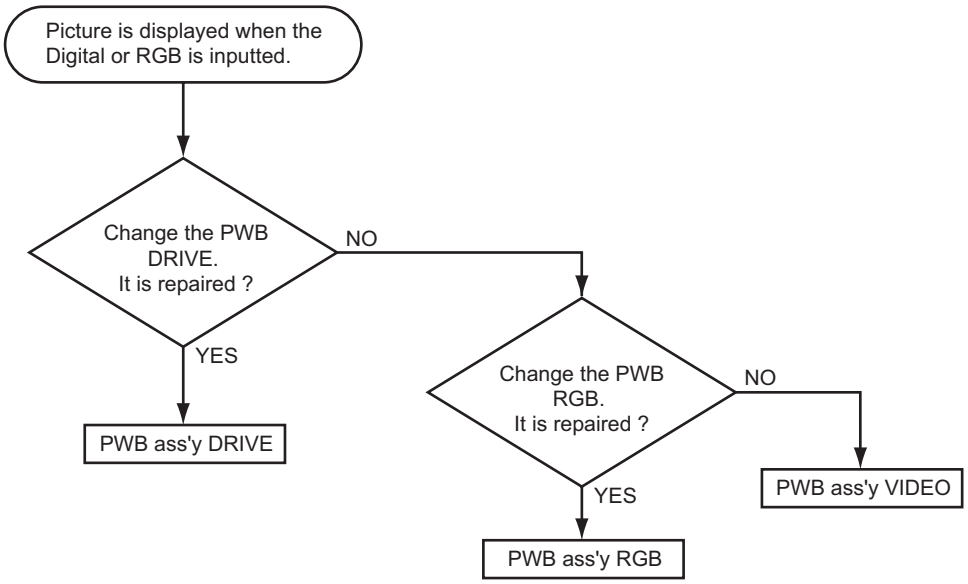

Power can not be turned on
Is power LED lit in orange ?
NO
YES
Does Projector turn on by Remote ?
NO
YES
Change the PWB ass'y KEYBOARD. Does power can be turned on ?
NO
YES
PWB ass'y DRIVE
PWB ass'y KEYBOARD
It there sound like "shu" when the Projector turns on ?
NO
YES
Power unit (circuit)
PWB ass'y FILTER
FUSE
Disconnect connector from PWB ass'y TP-SW. Does projector turn on ?
YES
NO
PWB ass'y TEMP
Change the PWB ass'y DRIVE. Does power can be turned on ?
NO
YES
PWB ass'y DRIVE
Change the PWB ass'y VIDEO. Does power can be turned on ?
NO
YES
Power unit (circuit)
PWB ass'y VIDEO

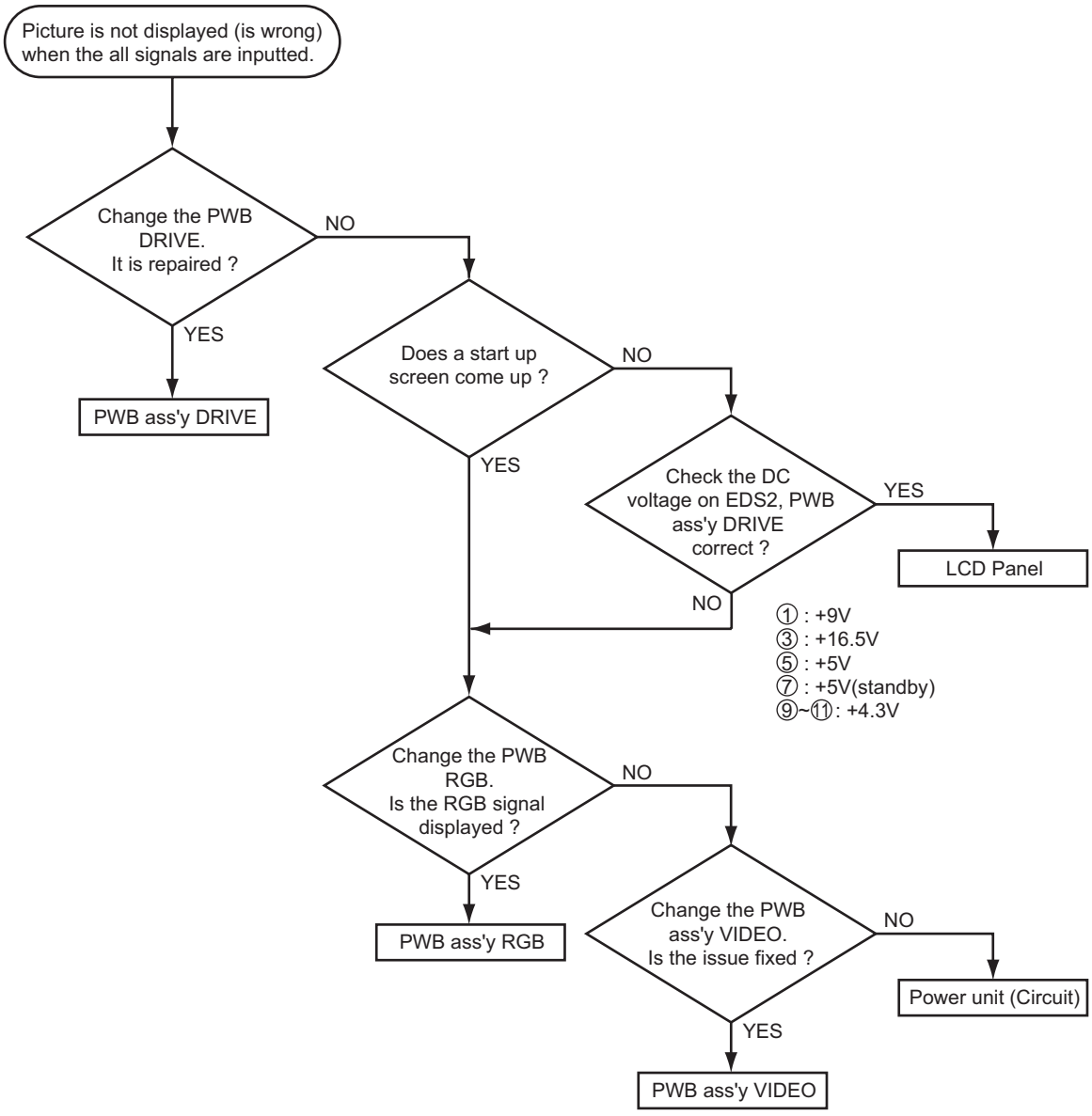

Lamp does not light
Disconnect flexible connector from EMD1 connector. And light on?
NO
YES
PWB ass'y DRIVE
Replace the PWB ass'y FAN and remove the PWB ass'y DRIVE. Does lamp light ?
NO
YES
PWB ass'y FAN
What is the state of LAMP indicator during operation ?
Light
Blinks
Not light
Change the Lamp. Does Lamp light ?
YES
LAMP
NO
Change the Power unit (Ballast). Does Lamp light ?
YES
Power unit (Ballast)
NO
Power unit (Circuit)
Is the Lamp cover set ?
NO
Set the Lamp cover again
YES
Is the Lamp installed correctly ?
NO
Set the Lamp again
YES
Change the LIMIT SWITCH (LAMP/LAMP DOOR). Does Lamp light ?
YES
LIMIT SWITCH (LAMP/LAMP DOOR)
NO
Power unit (Circuit)
Is TEMP indicator flashing ?
NO
YES
One of FANS is broke change then one by one and find out.
Change the Power unit (Ballast) Does Lamp light ?
NO
YES
Power unit (Ballast)
Power unit (Circuit)

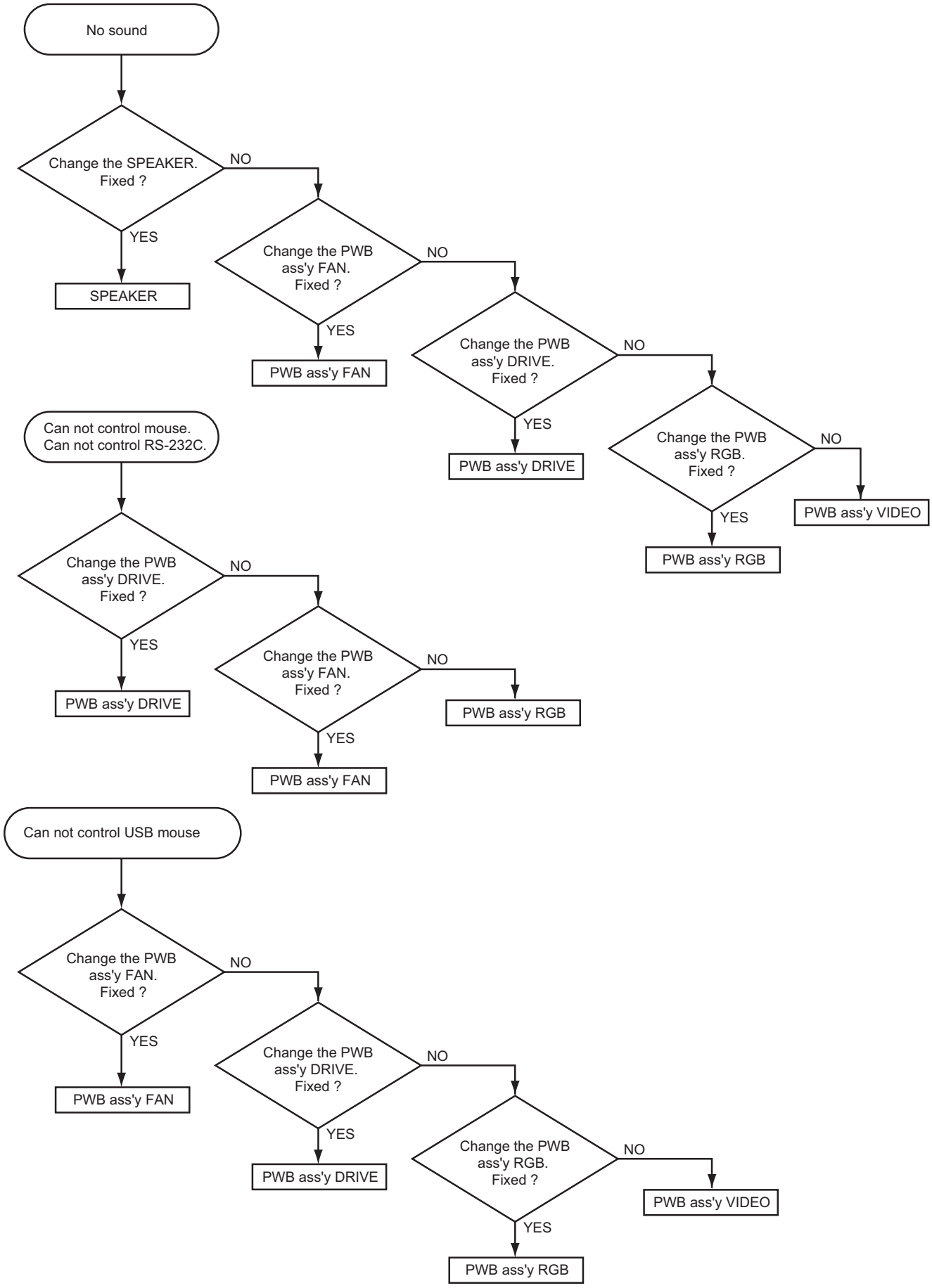

Picture is not displayed (is wrong) when the RGB Signal is inputted.
Picture is displayed when the VIDEO or DIGITAL.
Is RGB1 or a picture of which of RGB2 displayed ?
NO
YES
Change the PWB ass'y DRIVE. Is it repaired ?
NO
YES
PWB ass'y DRIVE
Change the PWB ass'y RGB. Is it repaired ?
NO
YES
PWB ass'y RGB
Change the PWB ass'y RGB. Is it repaired ?
NO
YES
PWB ass'y RGB
Change the PWB ass'y DRIVE. Is it repaired ?
NO
YES
PWB ass'y DRIVE
Change the PWB ass'y VIDEO. Is it repaired ?
NO
YES
Power unit (Circuit)
PWB ass'y VIDEO


Picture is not displayed (is wrong) when the DIGITAL Signal is inputted.
Picture is displayed when the RGB or VIDEO is inputted.
Change the PWB ass'y DRIVE. Is it repaired ?
NO
YES
PWB ass'y DRIVE
PWB ass'y FAN


Picture is not displayed (is wrong) when the RGB Signal output
Video picture is displayed. (Only RGB is wrong.)
PWB ass'y RGB


Picture is displayed when the Digital or RGB is inputted.
Change the PWB DRIVE. It is repaired ?
NO
YES
PWB ass'y DRIVE
Change the PWB RGB. It is repaired ?
NO
YES
PWB ass'y VIDEO
PWB ass'y RGB


Picture is not displayed (is wrong) when the all signals are inputted.
Change the PWB DRIVE. It is repaired ?
NO
YES
PWB ass'y DRIVE
Does a start up screen come up ?
NO
YES
Check the DC voltage on EDS2, PWB ass'y DRIVE correct ?
YES
LCD Panel
NO
① : +9V
③ : +16.5V
⑤ : +5V
⑦ : +5V(standby)
⑨~⑪: +4.3V
Change the PWB RGB. Is the RGB signal displayed ?
NO
YES
PWB ass'y RGB
Change the PWB ass'y VIDEO. Is the issue fixed ?
NO
Power unit (Circuit)
YES
PWB ass'y VIDEO

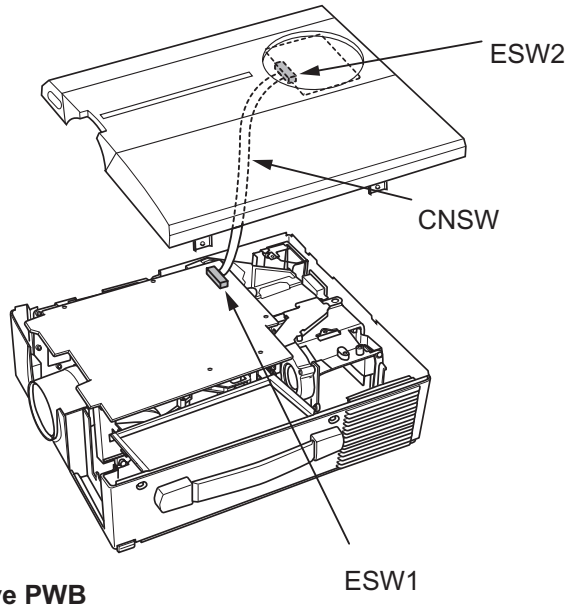

No sound
Change the SPEAKER. Fixed ?
NO
YES
SPEAKER
Change the PWB ass'y FAN. Fixed ?
NO
YES
PWB ass'y FAN
Change the PWB ass'y DRIVE. Fixed ?
NO
YES
PWB ass'y DRIVE
Change the PWB ass'y RGB. Fixed ?
NO
YES
PWB ass'y VIDEO
PWB ass'y RGB
Can not control mouse.
Can not control RS-232C.
Change the PWB ass'y DRIVE. Fixed ?
NO
YES
PWB ass'y DRIVE
Change the PWB ass'y FAN. Fixed ?
NO
YES
PWB ass'y RGB
PWB ass'y FAN
Can not control USB mouse
Change the PWB ass'y FAN. Fixed ?
NO
YES
PWB ass'y FAN
Change the PWB ass'y DRIVE. Fixed ?
NO
YES
PWB ass'y DRIVE
Change the PWB ass'y RGB. Fixed ?
NO
YES
PWB ass'y VIDEO
PWB ass'y RGB

6. Service points

6 - 1 POINT

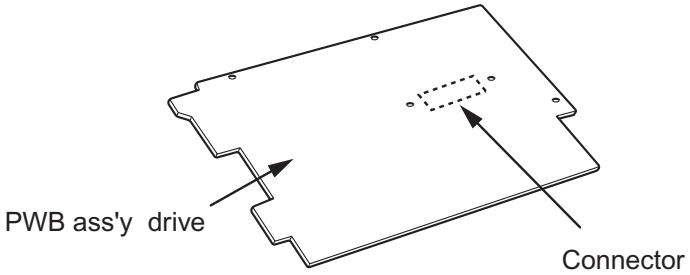
• Cautions when removing the Upper case

In the Upper case, an operation PWB is installed. When removing, lift carefully without using excessive force to prevent damaging the ESW1 and ESW2 connector.



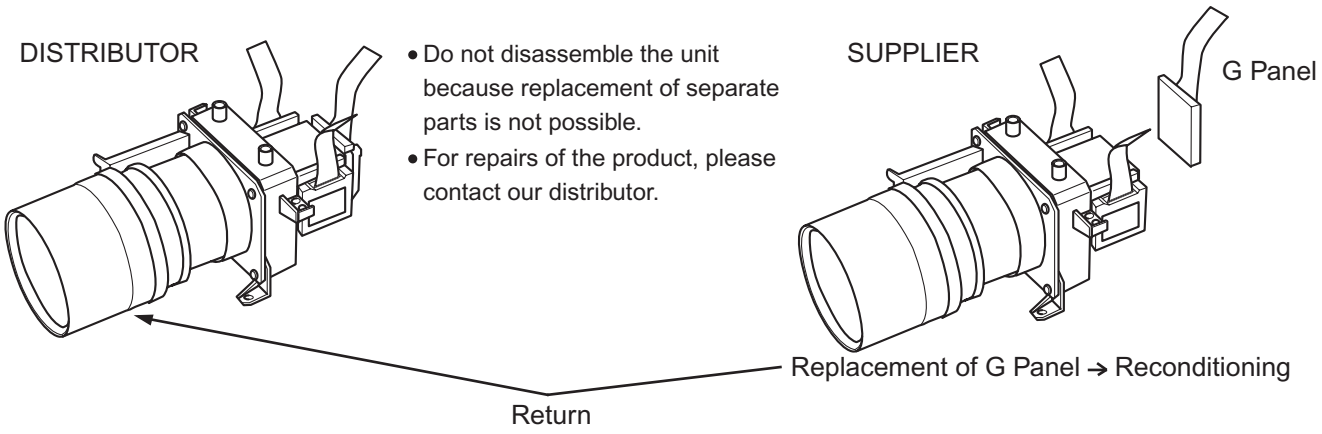
• Cautions when removing the drive PWB

When removing the drive PWB, there is danger of damaging the connector connecting the fan PWB. Lift up the part near the drive PWB connector and disconnect the connector before removing the drive PWB.



• Before Replacing the LCD / Lens Prism

You should not replace separately the parts of the liquid crystal LCD / Lens Prism because it works properly only when used together. Therefore, regarding these parts, you can either replace part , LCD / Lens Prism ass'y, or send the whole unit LCD / Lens Prism ass'y back to SUPPLIER, where we will replace the malfunctioning part, recondition the device and send it back to you. In that case please contact our distributor.


DISTRIBUTOR
• Do not disassemble the unit because replacement of separate parts is not possible.
• For repairs of the product, please contact our distributor.
SUPPLIER
G Panel
Replacement of G Panel → Reconditioning
Return

6 - 2 About Lamp Replacement

Light source lamp has a service life.
The picture will become dark or color will be poor when the lamp is used for a long time.
If usage of lamp is continued in such cases, it could cause a malfunction. Replace lamp with new one.
As reference for replacement time, indicator will operate or message will be displayed when the power is turned on.
In these cases the lamp should be replaced.

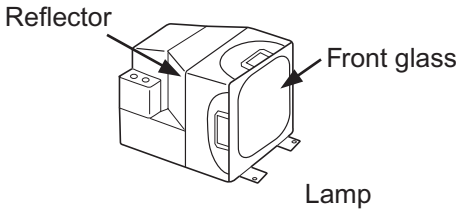
> Caution Also LAMP indicator will light when the lamp becomes too hot. Turn off the power and let the projector cool for 45 minutes. Turn on.

● How to replace lamp (Option lamp : Lamp unit DT00341)

HIGH VOLTAGE
HIGH TEMPERATURE
HIGH PRESSURE

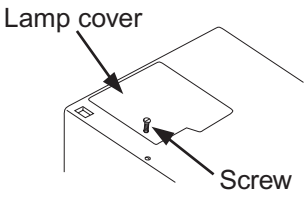
When replacing lamp, turn off and remove AC cord, wait 45 minutes to let lamp cool. High-pressure lamp when hot, may explode if improperly handled.

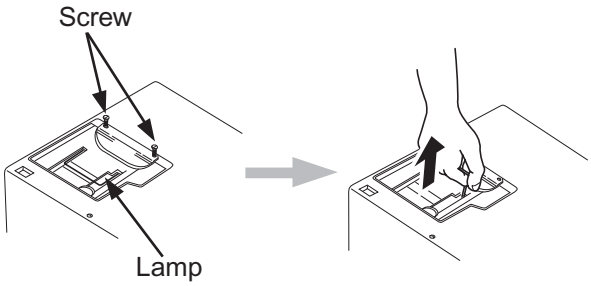
Caution
- For disposal of used lamp, treat according to the instruction of community authorities.
- Since the lamp is made of glass, do not apply shock to it and do not scratch it.
- Also, do not use old lamp. This could also cause explosion of the lamp.
- If it is probable that the lamp has exploded (explosive sound is heard), disconnect the power plug from the power outlet and replace lamp.
- In rare cases, the reflector and the inside of the projector may be damaged by scattered broken pieces of glass, and broken pieces could cause injury when being handled.



1. Turn the main power switch off and disconnect the power plug from the power outlet.
2. Remove the lamp cover.
   - If lamp is hot at this time, this could cause burn. Wait for minimum 45 minutes until lamp is cooled down.
   - Loosen a screw and remove the cover.
3. Loosen two screws and pull the handle to remove the lamp.
   - If the screws are not loosened completely, your fingers may be damaged.
   - Do not insert your hand into the box after the lamp is removed.

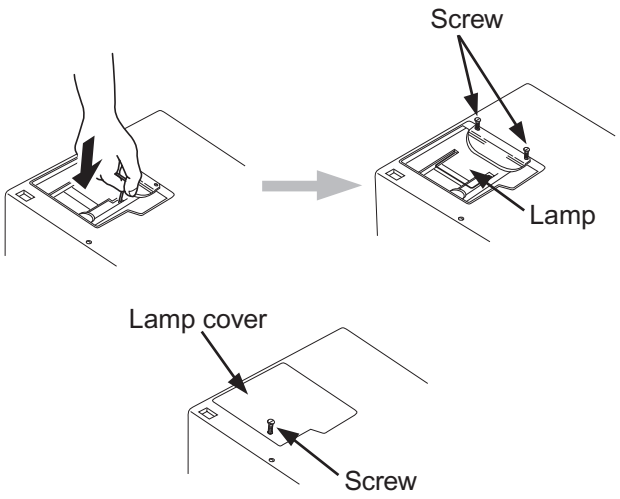
   (There are optical parts inside. If touched by hand, it may result in color unevenness, etc.)





4. Replace the lamp with new one and fix it using the same two screws.
   - Firmly tighten the lamp screws. Loose screws may cause bad connection of the connector which in turn may result in malfunctioning.
5. Install the lamp cover and fix it using screws.
   - To prevent burn, install the lamp cover and secure it using the screws.
   - Do not turn on the power with lamp cover removed.

- Whenever the lamp is replaced, reset the total operation time of the lamp. Do not reset if the lamp has not been replaced.
- Do not perform resetting without changing the lamp, as this can cause lamp breakage.



6 - 3 Resetting the Lamp Timer

Reset the lamp timer after replacing the lamp. When the lamp has been replaced after the LAMP indicator is red, or the CHANGE THE LAMP message is displayed, complete the following operation within 10 minutes of switching power ON. The power will be turned off automatically in over 10 minutes.

1. Switch power ON, and press the RESET button, for approximately three seconds. The 'LAMP xxxx hr' message will appear on the lamp timer on the bottom of the screen.
2. Press the MENU button on the remote control transmitter, or the RESET button on the control panel, while the lamp timer is displayed. The 'LAMP xxxx ☐ → 0 ■ CANCEL' then appear.
3. Press the ◄ and select 0, and wait until the timer display is cleared.

NOTE:

Do not reset the lamp timer without replacing the lamp. Reset the lamp timer always when replacing the lamp. The message functions will not operate properly if the lamp timer is not reset correctly.

6 - 4 Air Filter Maintenance

The air filter should be cleaned as described below at intervals of approximately 100 hours.

1. Switch the projector power supply OFF, and remove the power cord from the power outlet.
2. Clean the air filter with a vacuum cleaner.

- Switch power OFF and remove the power cord from the power outlet before beginning maintenance work. Please read the separate "SAFETY INSTRUCTIONS" thoroughly to ensure that maintenance is performed correctly.
- Replace the air filter if contamination cannot be removed, or if it is damaged. Contact your dealer in such case.(Option Air filter : MU00832)
- Do not use the equipment with the air filter removed.
- When the air filter is clogged with dust etc. the CHECK AIR FLOW message appears on the screen and the power supply is switched OFF automatically to prevent the temperature rising inside the projector.

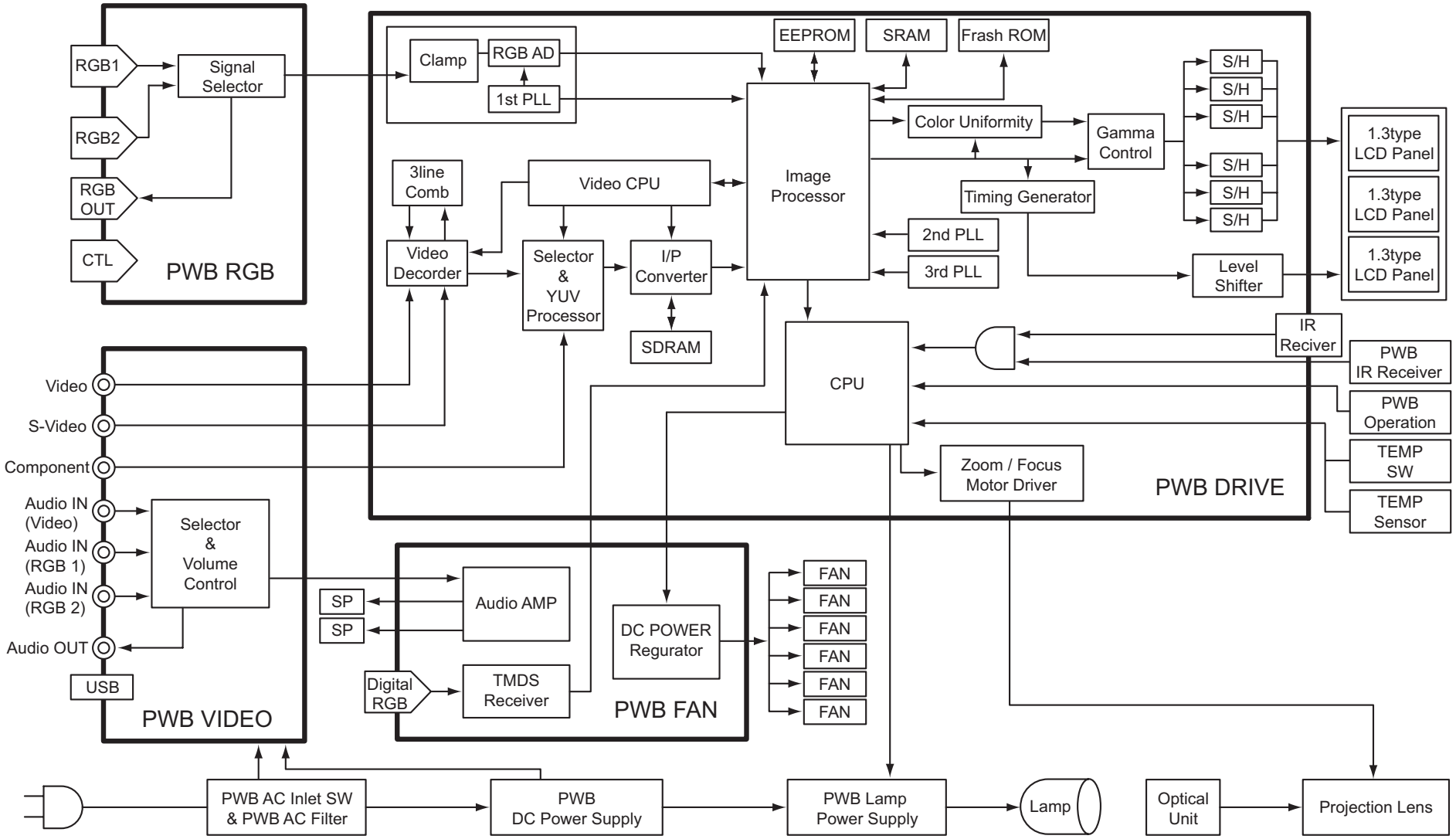
6 - 5 High-altitude Operation Mode

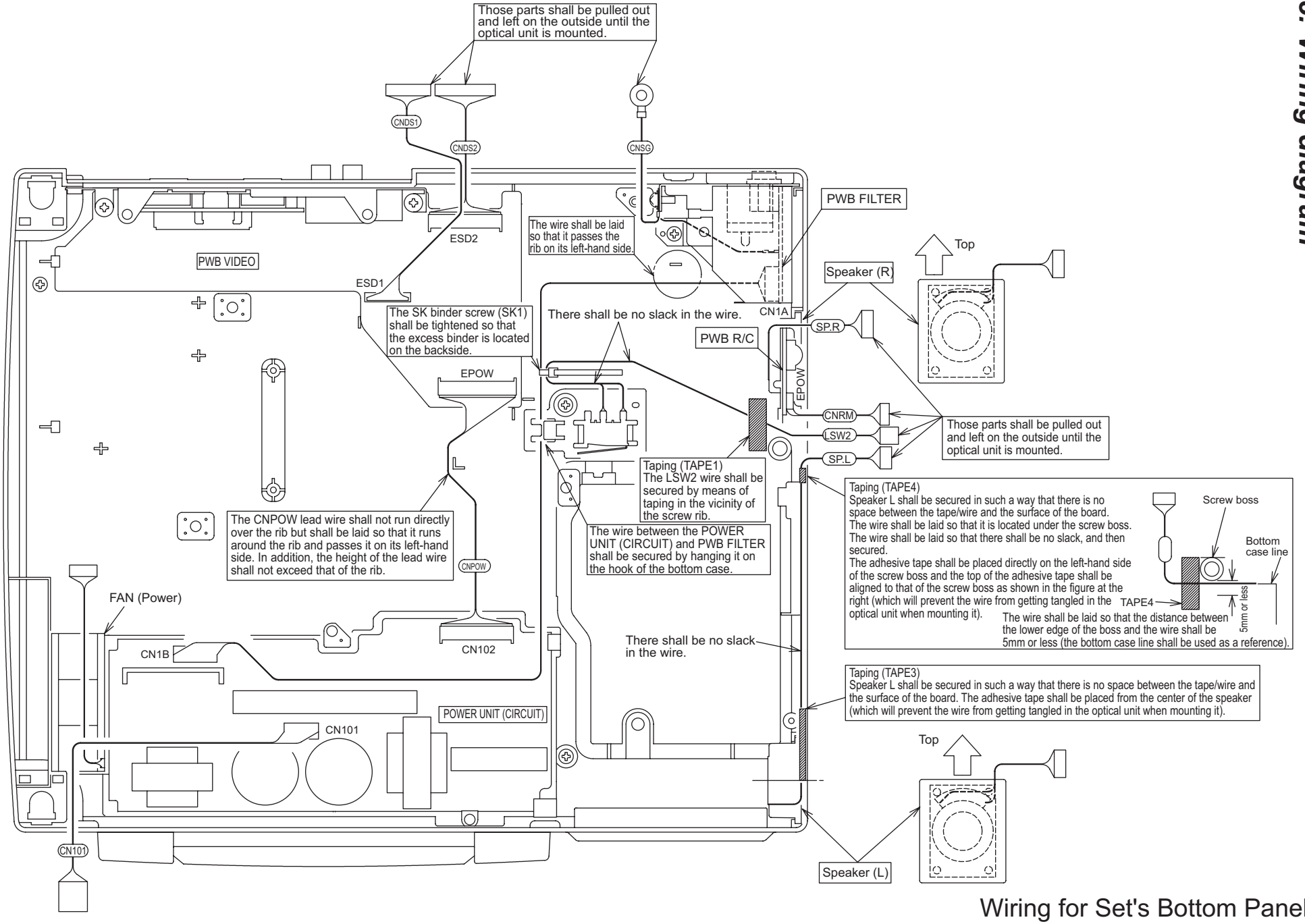
When using the unit in low atmospheric pressure areas, you can boost the fan speed to increase cooling efficiency.

1. While video is being displayed, press the MENU button on the remote control, and, while OPT item in the menu stays selected, press and hold down the MAGNIFY OFF button for 3 seconds.
2. The FAN SPEED Switch menu is displayed. Set up the fan speed by selecting NORMAL/HIGH.

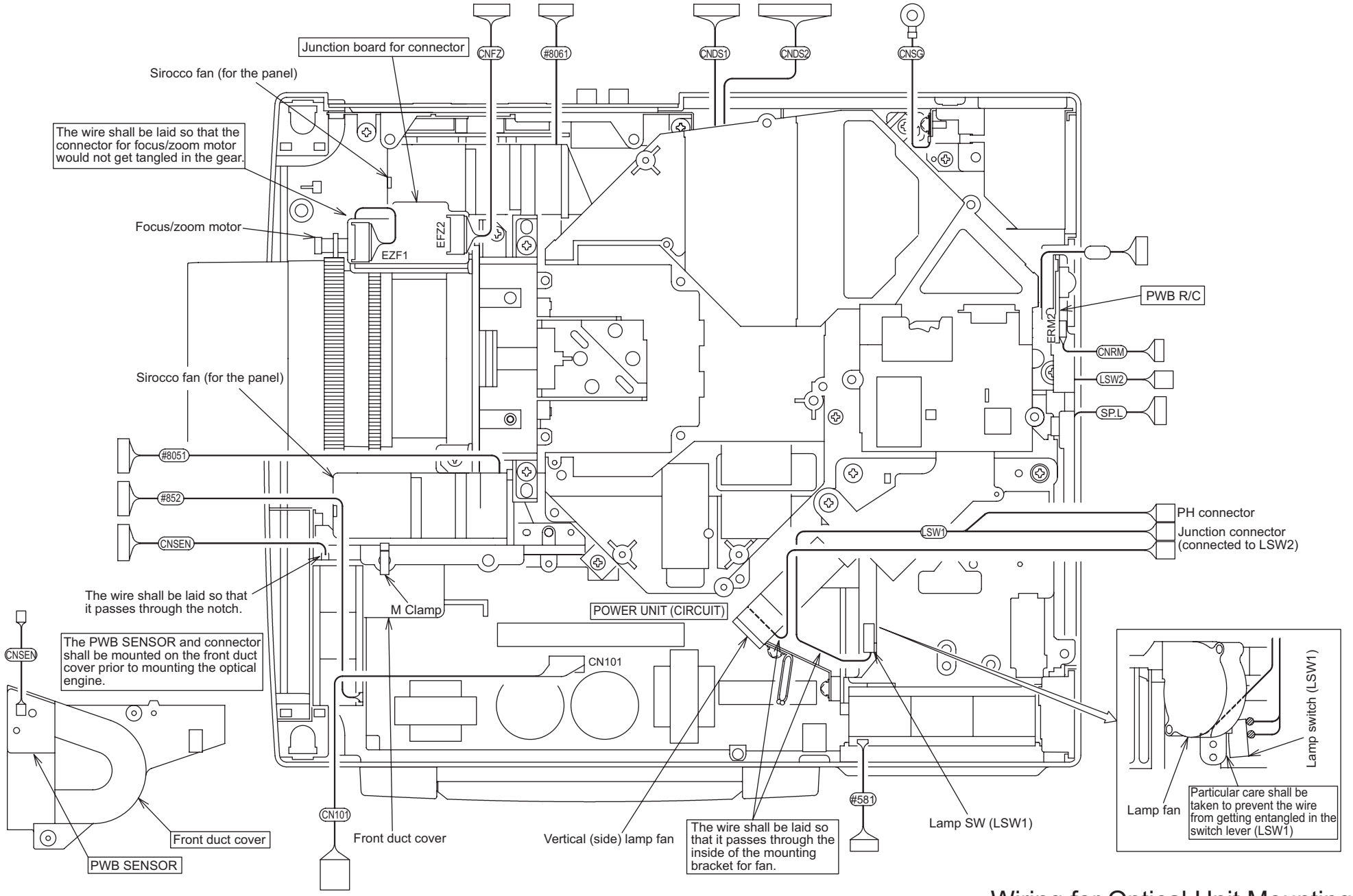
*When you want to change the setting again, repeat the same procedure.

7. Block diagram

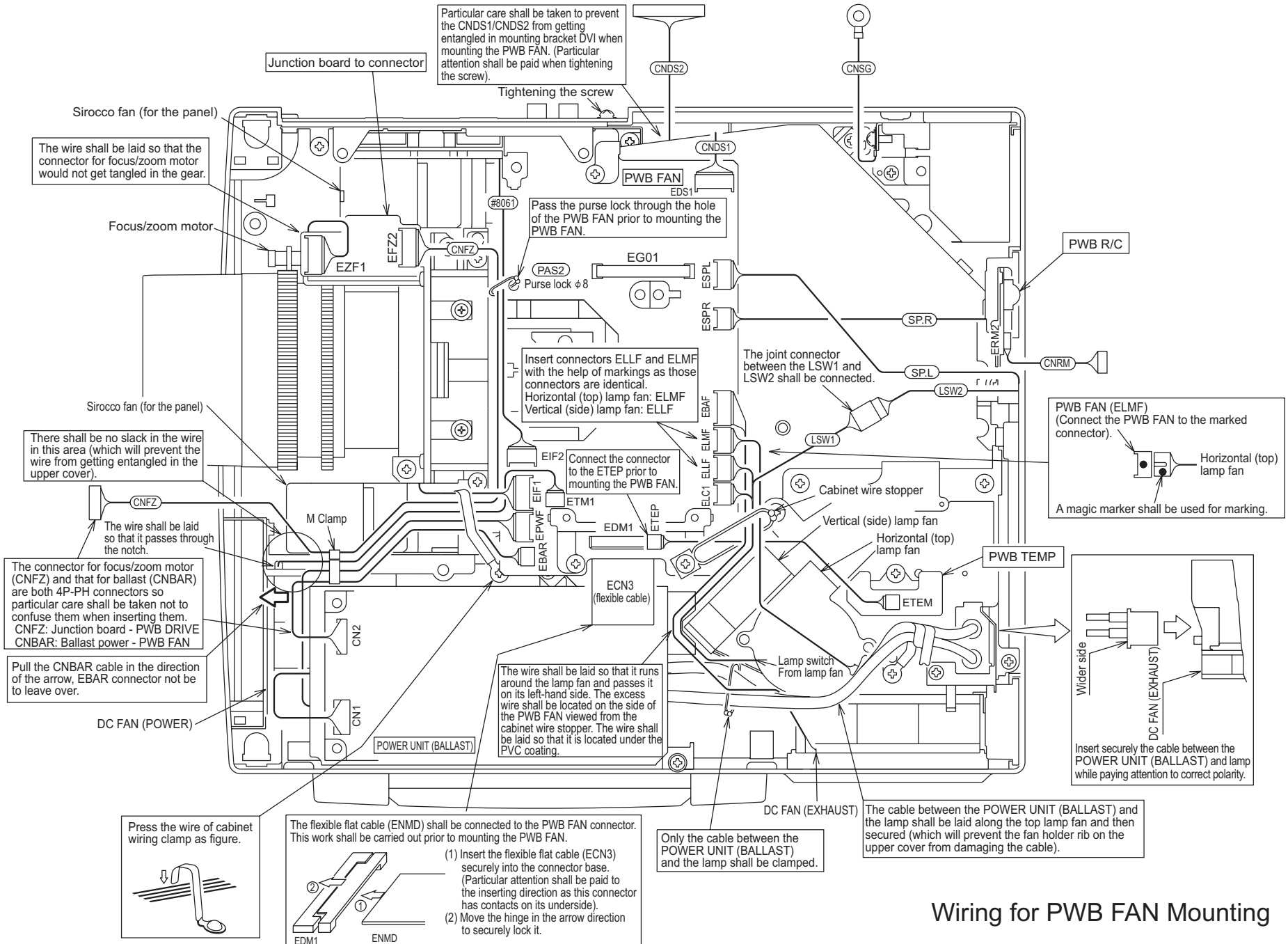



Those parts shall be pulled out and left on the outside until the optical unit is mounted.
CNDS1
CNDS2
CNSG
PWB FILTER
ESD2
The wire shall be laid so that it passes the rib on its left-hand side.
PWB VIDEO
ESD1
Top
Speaker (R)
The SK binder screw (SK1) shall be tightened so that the excess binder is located on the backside.
There shall be no slack in the wire.
CN1A
SP.R
PWB R/C
EPOW
EPOW
CNRM
LSW2
SP.L
Those parts shall be pulled out and left on the outside until the optical unit is mounted.
Taping (TAPE1)
The LSW2 wire shall be secured by means of taping in the vicinity of the screw rib.
The CNPOW lead wire shall not run directly over the rib but shall be laid so that it runs around the rib and passes it on its left-hand side. In addition, the height of the lead wire shall not exceed that of the rib.
The wire between the POWER UNIT (CIRCUIT) and PWB FILTER shall be secured by hanging it on the hook of the bottom case.
CNPOW
FAN (Power)
CN1B
CN102
There shall be no slack in the wire.
Taping (TAPE4)
Speaker L shall be secured in such a way that there is no space between the tape/wire and the surface of the board.
The wire shall be laid so that it is located under the screw boss.
The wire shall be laid so that there shall be no slack, and then secured.
The adhesive tape shall be placed directly on the left-hand side of the screw boss and the top of the adhesive tape shall be aligned to that of the screw boss as shown in the figure at the right (which will prevent the wire from getting tangled in the optical unit when mounting it).
Screw boss
Bottom case line
TAPE4
5mm or less
The wire shall be laid so that the distance between the lower edge of the boss and the wire shall be 5mm or less (the bottom case line shall be used as a reference).
Taping (TAPE3)
Speaker L shall be secured in such a way that there is no space between the tape/wire and the surface of the board. The adhesive tape shall be placed from the center of the speaker (which will prevent the wire from getting tangled in the optical unit when mounting it).
POWER UNIT (CIRCUIT)
CN101
Top
CN101
Speaker (L)

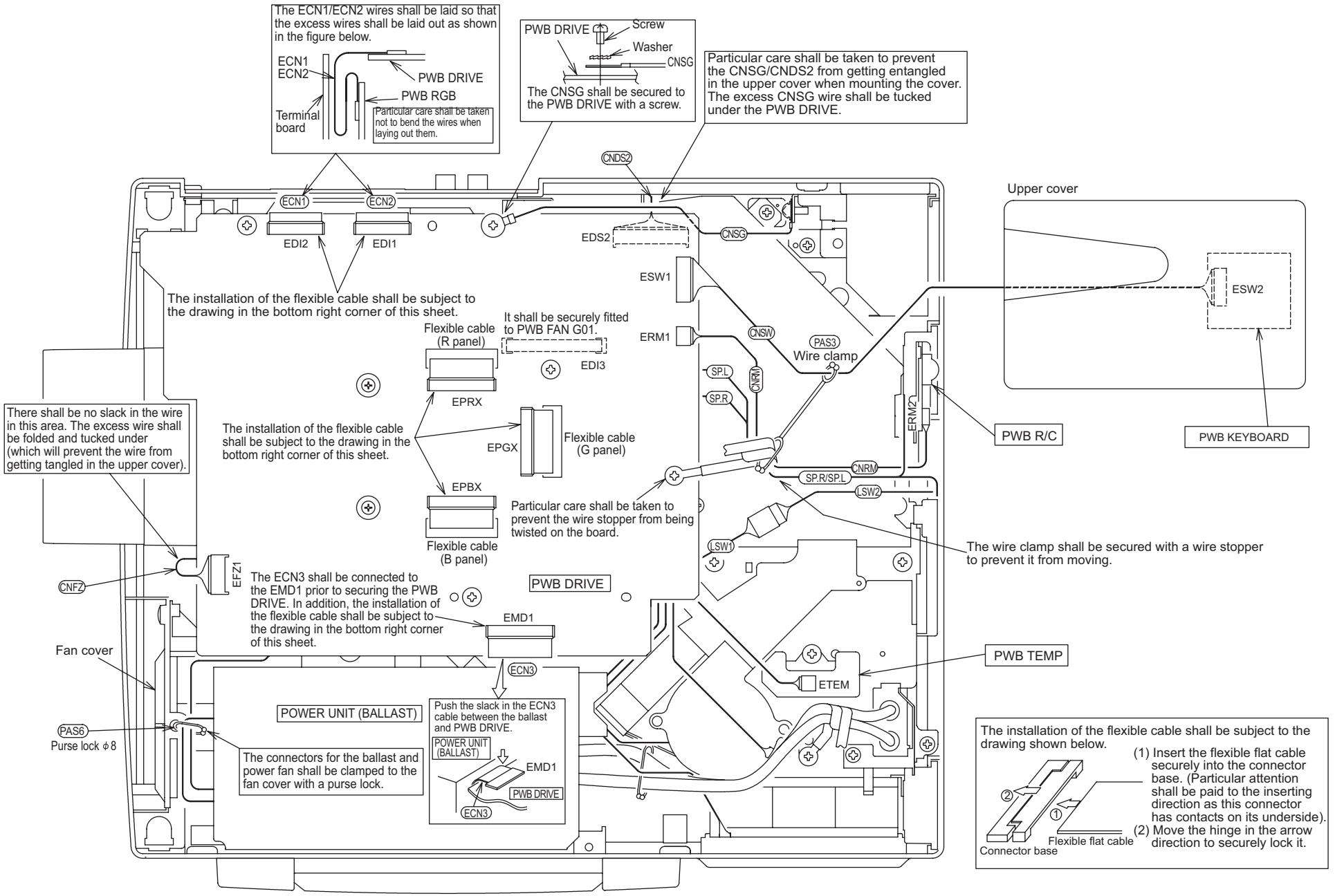
Wiring for Set's Bottom Panel



Wiring for Optical Unit Mounting


Particular care shall be taken to prevent the CNDS1/CNDS2 from getting entangled in mounting bracket DVI when mounting the PWB FAN. (Particular attention shall be paid when tightening the screw).
Junction board to connector
Tightening the screw
CNDS2
CNSG
Sirocco fan (for the panel)
The wire shall be laid so that the connector for focus/zoom motor would not get tangled in the gear.
CNDS1
PWB FAN
EDS1
#8061
Pass the purse lock through the hole of the PWB FAN prior to mounting the PWB FAN.
Focus/zoom motor
EFZ2
CNFZ
EZF1
PAS2
Purse lock ϕ8
EG01
ESPL
ESPR
PWB R/C
SP.R
ERM2
CNRM
SP.L
LSW2
The joint connector between the LSW1 and LSW2 shall be connected.
Insert connectors ELLF and ELMF with the help of markings as those connectors are identical.
Horizontal (top) lamp fan: ELMF
Vertical (side) lamp fan: ELLF
EBAF
ELMF
ELLF
ELC1
LSW1
PWB FAN (ELMF)
(Connect the PWB FAN to the marked connector).
Horizontal (top) lamp fan
A magic marker shall be used for marking.
Sirocco fan (for the panel)
There shall be no slack in the wire in this area (which will prevent the wire from getting entangled in the upper cover).
EIF2
Connect the connector to the ETEP prior to mounting the PWB FAN.
EIF1
ETM1
Cabinet wire stopper
CNFZ
M Clamp
EPWF
EBAR
EDM1
ETEP
Vertical (side) lamp fan
Horizontal (top) lamp fan
PWB TEMP
The wire shall be laid so that it passes through the notch.
The connector for focus/zoom motor (CNFZ) and that for ballast (CNBAR) are both 4P-PH connectors so particular care shall be taken not to confuse them when inserting them.
CNFZ: Junction board - PWB DRIVE
CNBAR: Ballast power - PWB FAN
ECN3
(flexible cable)
ETEM
CN2
Pull the CNBAR cable in the direction of the arrow, EBAR connector not be to leave over.
Lamp switch
From lamp fan
Wider side
DC FAN (EXHAUST)
Insert securely the cable between the POWER UNIT (BALLAST) and lamp while paying attention to correct polarity.
The wire shall be laid so that it runs around the lamp fan and passes it on its left-hand side. The excess wire shall be located on the side of the PWB FAN viewed from the cabinet wire stopper. The wire shall be laid so that it is located under the PVC coating.
CN1
DC FAN (POWER)
POWER UNIT (BALLAST)
DC FAN (EXHAUST)
The cable between the POWER UNIT (BALLAST) and the lamp shall be laid along the top lamp fan and then secured (which will prevent the fan holder rib on the upper cover from damaging the cable).
Only the cable between the POWER UNIT (BALLAST) and the lamp shall be clamped.
Press the wire of cabinet wiring clamp as figure.
The flexible flat cable (ENMD) shall be connected to the PWB FAN connector. This work shall be carried out prior to mounting the PWB FAN.
(1) Insert the flexible flat cable (ECN3) securely into the connector base. (Particular attention shall be paid to the inserting direction as this connector has contacts on its underside).
(2) Move the hinge in the arrow direction to securely lock it.
EDM1
ENMD

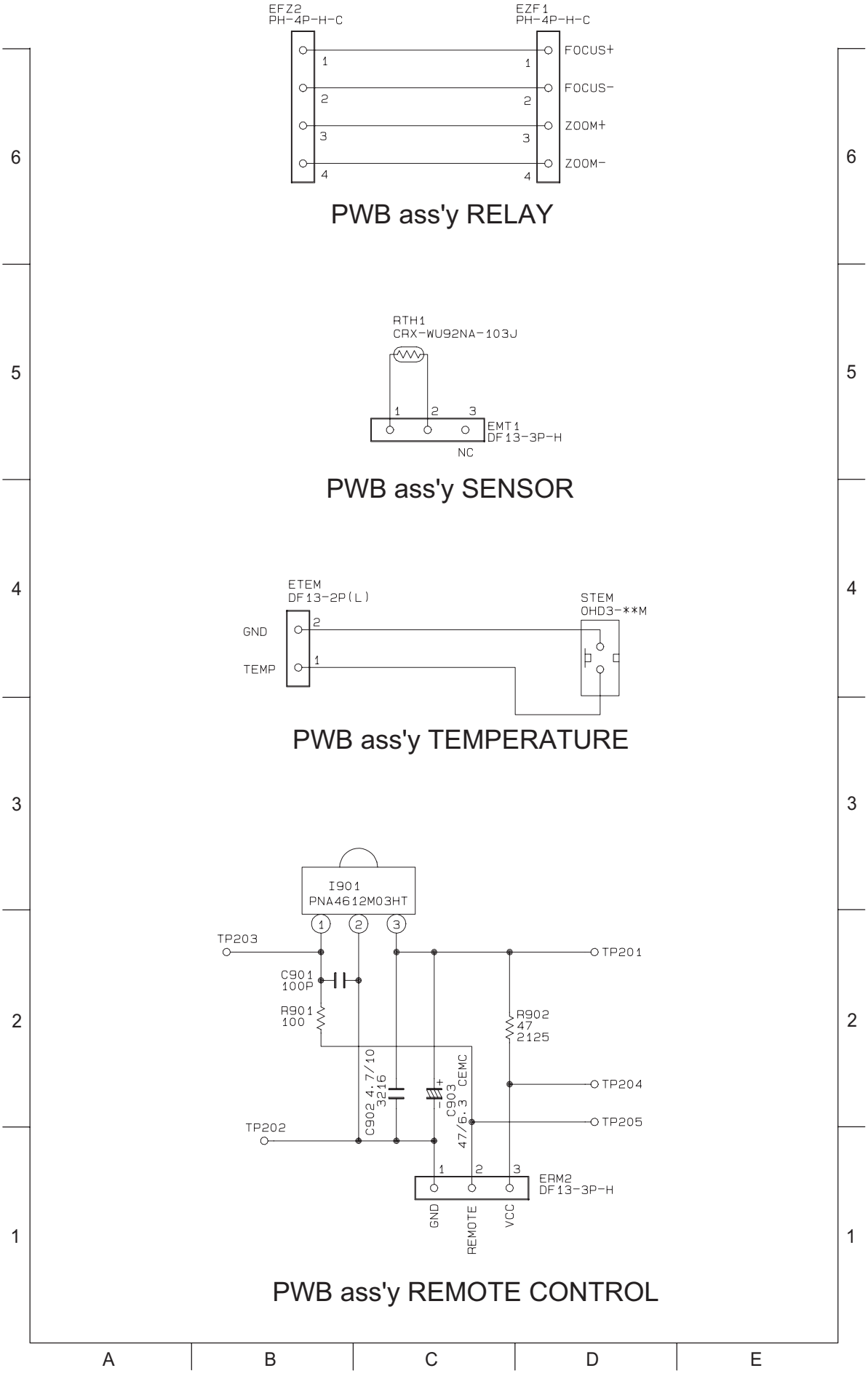
Wiring for PWB FAN Mounting

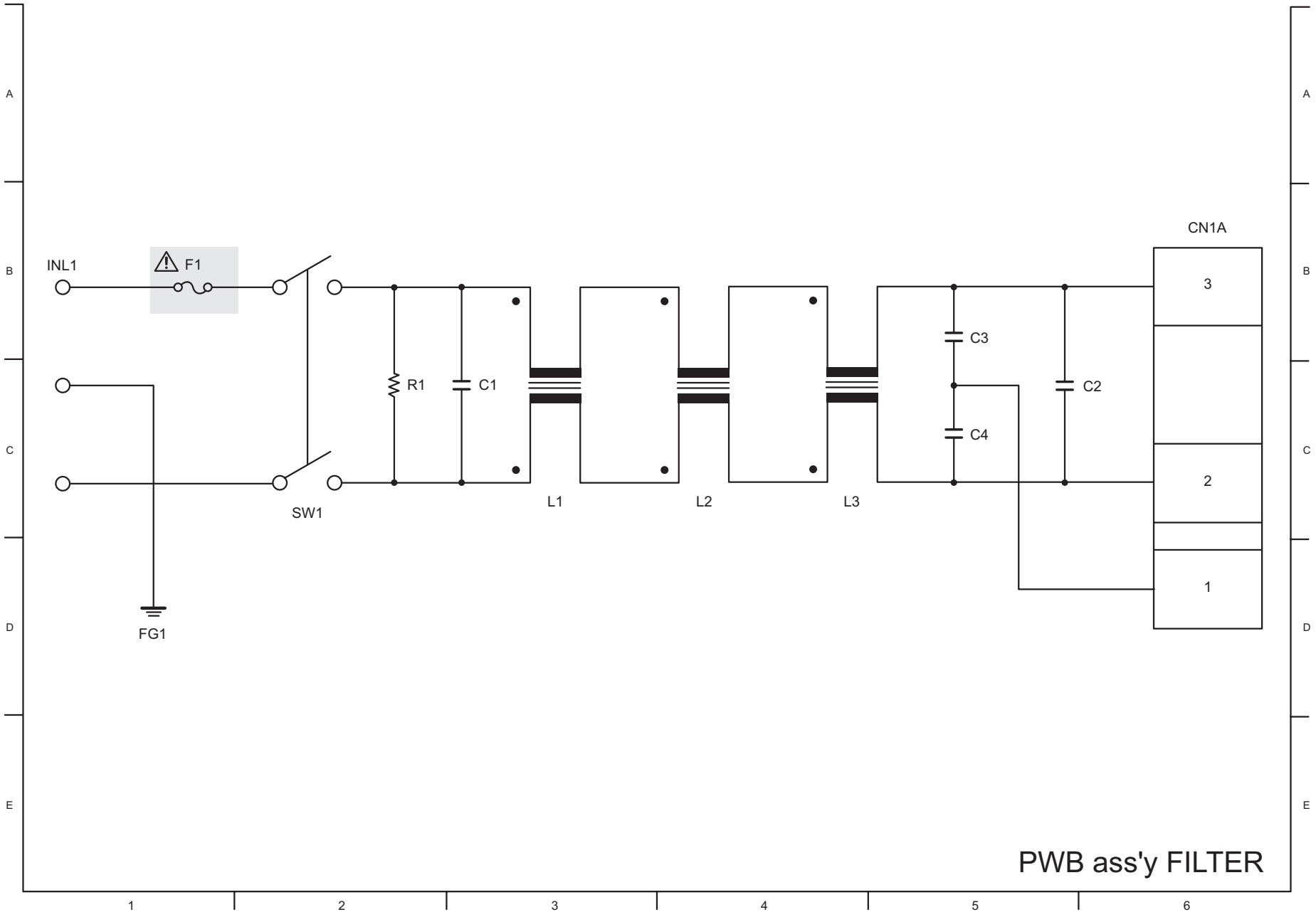

The ECN1/ECN2 wires shall be laid so that the excess wires shall be laid out as shown in the figure below.
ECN1
ECN2
PWB DRIVE
PWB RGB
Terminal board
Particular care shall be taken not to bend the wires when laying out them.
PWB DRIVE
Screw
Washer
CNSG
The CNSG shall be secured to the PWB DRIVE with a screw.
Particular care shall be taken to prevent the CNSG/CNDS2 from getting entangled in the upper cover when mounting the cover. The excess CNSG wire shall be tucked under the PWB DRIVE.
CNDS2
ECN1
ECN2
EDI2
EDI1
EDS2
CNSG
ESW1
ERM1
CNSW
PAS3
Wire clamp
SP.L
SP.R
CNRM
ERM2
Upper cover
ESW2
PWB R/C
PWB KEYBOARD
The installation of the flexible cable shall be subject to the drawing in the bottom right corner of this sheet.
Flexible cable (R panel)
It shall be securely fitted to PWB FAN G01.
EDI3
EPRX
The installation of the flexible cable shall be subject to the drawing in the bottom right corner of this sheet.
EPGX
Flexible cable (G panel)
EPBX
Flexible cable (B panel)
There shall be no slack in the wire in this area. The excess wire shall be folded and tucked under (which will prevent the wire from getting tangled in the upper cover).
Particular care shall be taken to prevent the wire stopper from being twisted on the board.
SP.R/SP.L
CNRM
LSW2
LSW1
The wire clamp shall be secured with a wire stopper to prevent it from moving.
CNFZ
EFZ1
The ECN3 shall be connected to the EMD1 prior to securing the PWB DRIVE. In addition, the installation of the flexible cable shall be subject to the drawing in the bottom right corner of this sheet.
PWB DRIVE
EMD1
Fan cover
ECN3
PWB TEMP
ETEM
POWER UNIT (BALLAST)
Push the slack in the ECN3 cable between the ballast and PWB DRIVE.
POWER UNIT (BALLAST)
EMD1
PWB DRIVE
ECN3
PAS6
Purse lock ϕ8
The connectors for the ballast and power fan shall be clamped to the fan cover with a purse lock.
The installation of the flexible cable shall be subject to the drawing shown below.
(1) Insert the flexible flat cable securely into the connector base. (Particular attention shall be paid to the inserting direction as this connector has contacts on its underside).
(2) Move the hinge in the arrow direction to securely lock it.
Flexible flat cable
Connector base

Wiring for PWB DRIVE Mounting

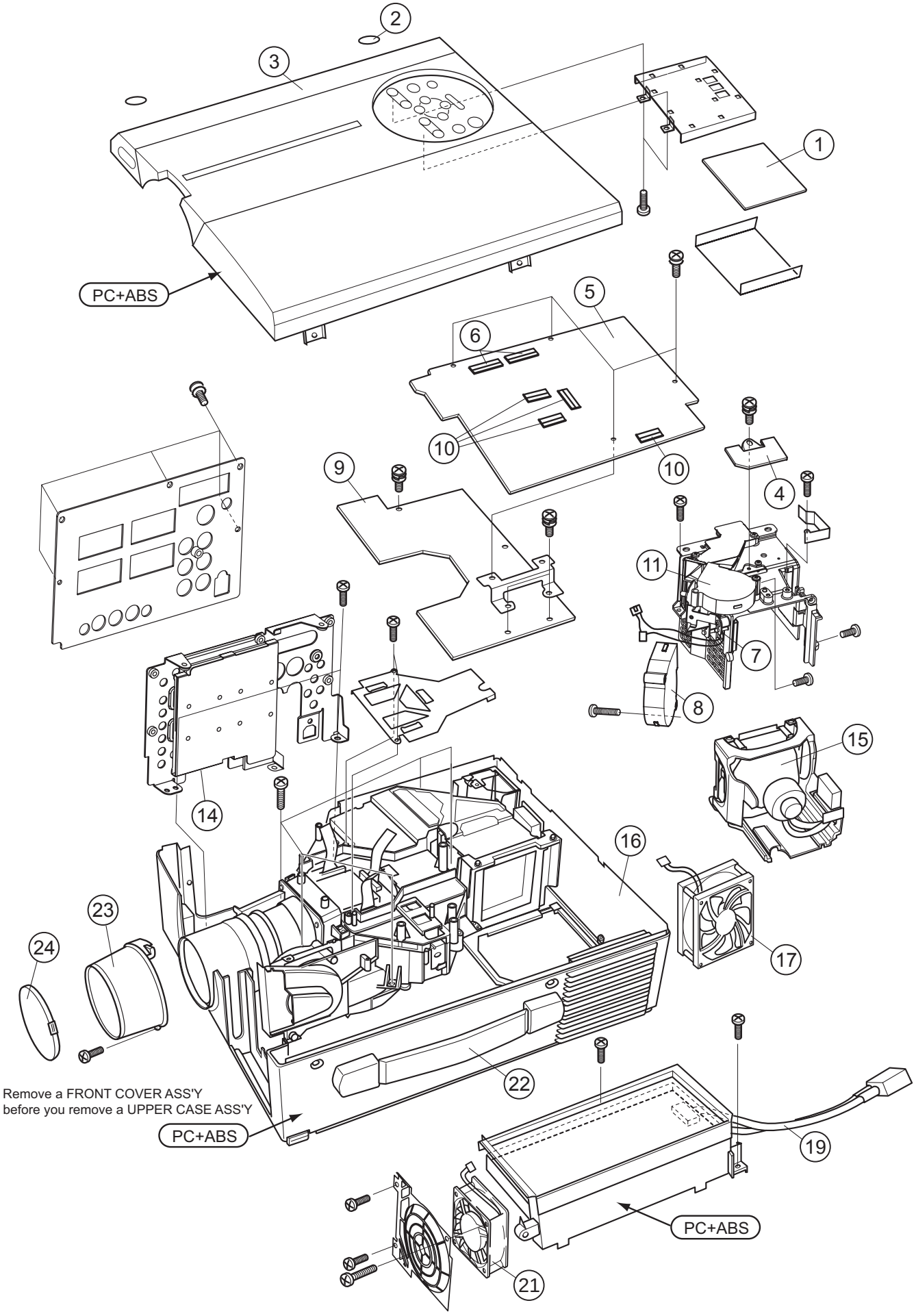
9. Basic circuit diagram

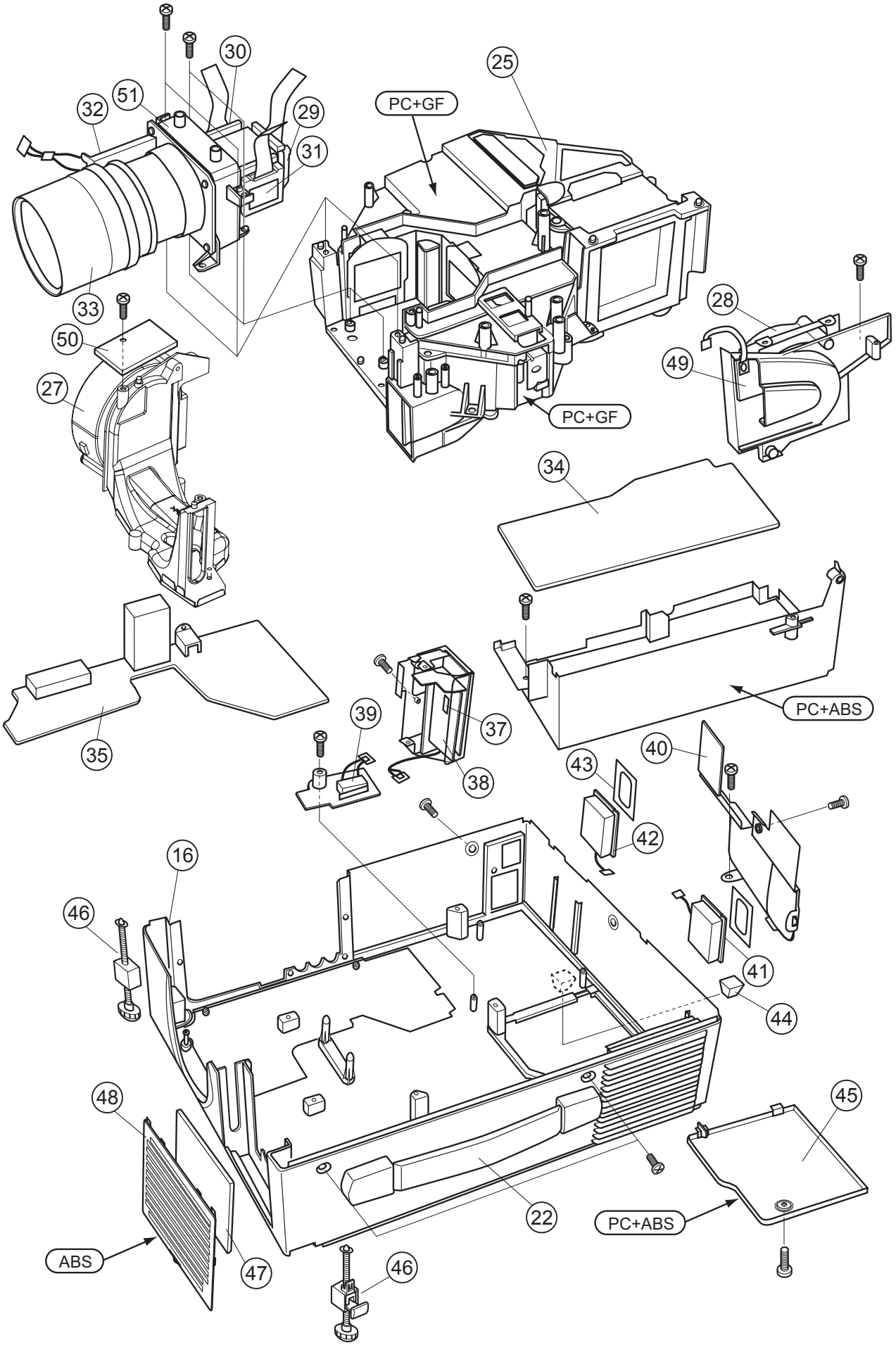
Parts with hatching are not mounted.




A
B
C
D
E
1
2
3
4
5
6
INL1
F1
SW1
FG1
R1
C1
L1
L2
L3
C3
C4
C2
CN1A
3
2
1
PWB ass'y FILTER

11. Disassembly diagram




30
25
51
32
29
PC+GF
31
33
28
50
49
27
PC+GF
34
PC+ABS
35
39
37
38
40
43
42
16
46
41
44
48
45
22
PC+ABS
ABS
47
46

THE UPDATED PARTS LIST

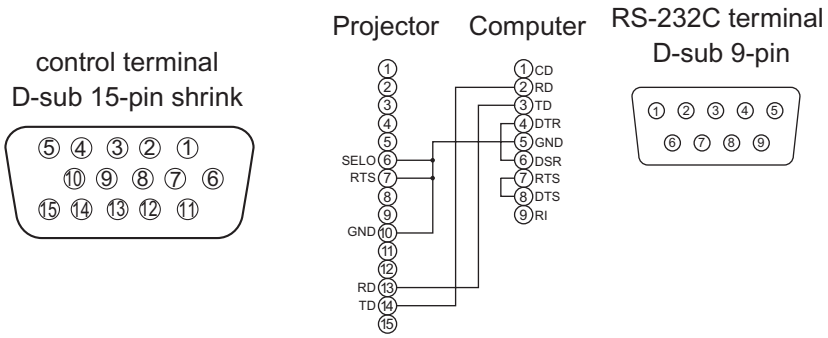
FOR THIS MODEL IS

AVAILABLE ON ESTA

13. RS-232C communication

(1) Turn off the projector and computer power supplies and connect with the RS-232C cable.

(2) Turn on the computer power supply and, after the computer has started up, turn on the projector power supply.



Communications setting

19200bps, 8N1

1 Protocol

Consist of header (7 bytes) + command data (6 bytes).

2 Header

BE + EF + 03 + 06 + 00 + CRC_low + CRC_high

CRC_low : Lower byte of CRC flag for command data.

CRC_high : Upper byte of CRC flag for command data.

3 Command data

Command data chart

byte_0	byte_1	byte_2	byte_3	byte_4	byte_5
Action		Type		Setting code	
low	high	low	high	low	high

Action (byte_0 - 1)

Action	Classification	Content
1	SET	Change setting to desired value.
2	GET	Read projector internal setup value.
4	INCREMENT	Increment setup value by 1.
5	DECREMENT	Decrement setup value by 1.
6	EXECUTE	Run a command.

Requesting projector status (Get command)

(1) Send the request code Header + Command data (‘02H’+‘00H’+ type (2 bytes) +‘00H’+‘00H’) from the computer to the projector.

(2) The projector returns the response code ‘1DH’+ data (2 bytes) to the computer.

Changing the projector settings (Set command)

(1) Send the setting code Header + Command data (‘01H’+‘00H’+ type (2 bytes) + setting code (2 bytes)) from the computer to the projector.

(2) The projector changes the setting based on the above setting code.

(3) The projector returns the response code ‘06H’ to the computer.

Using the projector default settings (Reset Command)

(1) The computer sends the default setting code Header + Command data (‘06H’+‘00H’+ type (2 bytes) +‘00H’+‘00H’) to the projector.

(2) The projector changes the specified setting to the default value.

(3) The projector returns the response code ‘06H’ to the computer.

Increasing the projector setting value (Increment command)

(1) The computer sends the increment code Header + Command data (‘04H’+‘00H’+ type (2 bytes) +‘00H’+‘00H’) to the projector.

(2) The projector increases the setting value on the above setting code.

(3) The projector returns the response code ‘06H’ to the computer.

Decreasing the projector setting value (Decrement command)

(1) The computer sends the decrement code Header + Command data (‘05H’+‘00H’+ type (2 bytes) +‘00H’+‘00H’) to the projector.

(2) The projector decreases the setting value on the above setting code.

(3) The projector returns the response code ‘06H’ to the computer.

When a command sent by the projector cannot be understood by the computer

When the command sent by the projector cannot be understood, the error command ‘15H’ is returned by the computer. Some times, the projector ignores RS-232C commands during other works. If the error command ‘15H’ is returned, please send the same command again.

When data sent by the projector cannot be practice

When the command sent by the projector cannot be practice, the error code ‘1cH’ +‘xxxxH’ is returned.

When the data length is greater than indicated by the data length code, the projector will ignore the excess data code. Conversely, when the data length is shorter than indicated by the data length code, an error code will be returned to the projector.

NOTE: • Operation cannot be guaranteed when the projector receives an undefined command or data.

• Provide an interval of at least 40ms between the response code and any other code.

• The projector outputs test data when the power supply is switched ON, and when the lamp is lit.

• Commands are not accepted during warm-up.

Command data chart

Names	Operation type		Header	CRC	Command data		
					Action	Type	Setting code
Blank Color	Set	Red	BE EF 03 06 00	3B D3	01 00	00 30	00 00
		Orange	BE EF 03 06 00	AB D2	01 00	00 30	01 00
		Green	BE EF 03 06 00	5B D2	01 00	00 30	02 00
		Blue	BE EF 03 06 00	CB D3	01 00	00 30	03 00
		Purple	BE EF 03 06 00	FB D1	01 00	00 30	04 00
		White	BE EF 03 06 00	6B D0	01 00	00 30	05 00
		Black	BE EF 03 06 00	9B D0	01 00	00 30	06 00
	Get		BE EF 03 06 00	08 D3	02 00	00 30	00 00
Mirror	Set	Normal	BE EF 03 06 00	C7 D2	01 00	01 30	00 00
		H Inverse	BE EF 03 06 00	57 D3	01 00	01 30	01 00
		V Inverse	BE EF 03 06 00	A7 D3	01 00	01 30	02 00
		H&V Inverse	BE EF 03 06 00	37 D2	01 00	01 30	03 00
	Get		BE EF 03 06 00	F4 D2	02 00	01 30	00 00
Freeze	Set	Normal	BE EF 03 06 00	83 D2	01 00	02 30	00 00
		Freeze	BE EF 03 06 00	13 D3	01 00	02 30	01 00
	Get		BE EF 03 06 00	B0 D2	02 00	02 30	00 00
Menu Color	Set	Red	BE EF 03 06 00	7F D3	01 00	03 30	00 00
		Orange	BE EF 03 06 00	EF D2	01 00	03 30	01 00
		Green	BE EF 03 06 00	1F D2	01 00	03 30	02 00
		Blub	BE EF 03 06 00	8F D3	01 00	03 30	03 00
		Purple	BE EF 03 06 00	BF D1	01 00	03 30	04 00
		Transparent	BE EF 03 06 00	2F D0	01 00	03 30	05 00
		Gray	BE EF 03 06 00	DF D0	01 00	03 30	06 00
	Get		BE EF 03 06 00	4C D3	02 00	03 30	00 00
Startup	Set	Turn ON	BE EF 03 06 00	0B D2	01 00	04 30	00 00
		Turn OFF	BE EF 03 06 00	9B D3	01 00	04 30	01 00
	Get		BE EF 03 06 00	38 D2	02 00	04 30	00 00
Language	Set	English	BE EF 03 06 00	F7 D3	01 00	05 30	00 00
		Français	BE EF 03 06 00	67 D2	01 00	05 30	01 00
		Deutsch	BE EF 03 06 00	97 D2	01 00	05 30	02 00
		Español	BE EF 03 06 00	07 D3	01 00	05 30	03 00
		Italiano	BE EF 03 06 00	37 D1	01 00	05 30	04 00
		Norsk	BE EF 03 06 00	A7 D0	01 00	05 30	05 00
		Nederlands	BE EF 03 06 00	57 D0	01 00	05 30	06 00
		Português	BE EF 03 06 00	C7 D1	01 00	05 30	07 00
		Japanese	BE EF 03 06 00	37 D4	01 00	05 30	08 00
	Get		BE EF 03 06 00	C4 D3	02 00	05 30	00 00

Command data chart

Names	Operation type		Header	CRC	Command data		
					Action	Type	Setting code
Magnify	Get		BE EF 03 06 00	7C D2	02 00	07 30	00 00
	Increment		BE EF 03 06 00	1A D2	04 00	07 30	00 00
	Decrement		BE EF 03 06 00	CB D3	05 00	07 30	00 00
Auto off	Get		BE EF 03 06 00	08 86	02 00	10 31	00 00
	Increment		BE EF 03 06 00	6E 86	04 00	10 31	00 00
	Decrement		BE EF 03 06 00	BF 87	05 00	10 31	00 00
Brightness Reset	Execute		BE EF 03 06 00	58 D3	06 00	00 70	00 00
Contrast Reset	Execute		BE EF 03 06 00	A4 D2	06 00	01 70	00 00
V.Position Reset	Execute		BE EF 03 06 00	E0 D2	06 00	02 70	00 00
H.Position Reset	Execute		BE EF 03 06 00	IC D3	06 00	03 70	00 00
H.Size Reset	Execute		BE EF 03 06 00	68 D2	06 00	04 70	00 00
Color Balance R Reset	Execute		BE EF 03 06 00	94 D3	06 00	05 70	00 00
Color Balance B Reset	Execute		BE EF 03 06 00	D0 D3	06 00	06 70	00 00
Sharpness Reset	Execute		BE EF 03 06 00	C4 D0	06 00	09 70	00 00
Color Reset	Execute		BE EF 03 06 00	80 D0	06 00	0A 70	00 00
Tint Reset	Execute		BE EF 03 06 00	7C D1	06 00	0B 70	00 00
Keystone Reset	Execute		BE EF 03 06 00	08 D0	06 00	0C 70	00 00
Auto	Execute		BE EF 03 06 00	91 D0	06 00	0A 20	00 00
Blank on/off	Set	off	BE EF 03 06 00	FB D8	01 00	20 30	00 00
		on	BE EF 03 06 00	6B D9	01 00	20 30	01 00
	Get		BE EF 03 06 00	C8 D8	02 00	20 30	00 00
Error Status	Get		BE EF 03 06 00	D9 D8	02 00	20 60	00 00
			(Example of Return) 00 00 (Normal) 01 00 (Cover-error) 02 00 (Fan-error) 03 00 (Lamp-error) 04 00 (reserved) 05 00 (reserved) 06 00 (Lamp-Time-over)				
Power	Set	OFF	BE EF 03 06 00	2A D3	01 00	00 60	00 00
		ON	BE EF 03 06 00	BA D2	01 00	00 60	01 00
	Get		BE EF 03 06 00	19 D3	02 00	00 60	00 00
Input Source	Set	RGB1	BE EF 03 06 00	FE D2	01 00	00 20	00 00
		RGB2	BE EF 03 06 00	3E D0	01 00	00 20	04 00
		Digital	BE EF 03 06 00	0E D2	01 00	00 20	03 00
		Video	BE EF 03 06 00	6E D3	01 00	00 20	01 00
		SVideo	BE EF 03 06 00	9E D3	01 00	00 20	02 00
		Component	BE EF 03 06 00	AE D1	01 00	00 20	05 00
	Get		BE EF 03 06 00	CD D2	02 00	00 20	02 00
Volume	Get		BE EF 03 06 00	31 D3	02 00	01 20	00 00
	Increment		BE EF 03 06 00	57 D3	04 00	01 20	00 00
	Decrement		BE EF 03 06 00	86 D2	05 00	01 20	00 00

Command data chart

Names	Operation type		Header	CRC	Command data		
					Action	Type	Setting code
Mute	Set	Normal	BE EF 03 06 00	46 D3	01 00	02 20	00 00
		Mute	BE EF 03 06 00	D6 D2	01 00	02 20	01 00
	Get		BE EF 03 06 00	75 D3	02 00	02 20	00 00
Brightness	Get		BE EF 03 06 00	89 D2	02 00	03 20	00 00
	Increment		BE EF 03 06 00	EF D2	04 00	03 20	00 00
	Decrement		BE EF 03 06 00	3E D3	05 00	03 20	00 00
Contrast	Get		BE EF 03 06 00	FD D3	02 00	04 20	00 00
	Increment		BE EF 03 06 00	9B D3	04 00	04 20	00 00
	Decrement		BE EF 03 06 00	4A D2	05 00	04 20	00 00
Color Balance R	Get		BE EF 03 06 00	01 D2	02 00	05 20	00 00
	Increment		BE EF 03 06 00	67 D2	04 00	05 20	00 00
	Decrement		BE EF 03 06 00	B6 D3	05 00	05 20	00 00
Color Balance B	Get		BE EF 03 06 00	45 D2	02 00	06 20	00 00
	Increment		BE EF 03 06 00	23 D2	04 00	06 20	00 00
	Decrement		BE EF 03 06 00	F2 D3	05 00	06 20	00 00
Keystone	Get		BE EF 03 06 00	B9 D3	02 00	07 20	00 00
	Increment		BE EF 03 06 00	DF D3	04 00	07 20	00 00
	Decrement		BE EF 03 06 00	0E D2	05 00	07 20	00 00
Aspect	Set	4:3	BE EF 03 06 00	9E D0	01 00	08 20	00 00
		16:9	BE EF 03 06 00	0E D1	01 00	08 20	01 00
		Small	BE EF 03 06 00	FE D1	01 00	08 20	02 00
	Get		BE EF 03 06 00	AD D0	02 00	08 20	00 00
Display Position at 16 : 9 or Small	Set	Default	BE EF 03 06 00	62 D1	01 00	09 20	00 00
		Bottom	BE EF 03 06 00	F2 D0	01 00	09 20	01 00
		Top	BE EF 03 06 00	02 D0	01 00	09 20	02 00
	Get		BE EF 03 06 00	51 D1	02 00	09 20	00 00
V.Position	Get		BE EF 03 06 00	0D 83	02 00	00 21	00 00
	Increment		BE EF 03 06 00	6B 83	04 00	00 21	00 00
	Decrement		BE EF 03 06 00	BA 82	05 00	00 21	00 00
H.Position	Get		BE EF 03 06 00	F1 82	02 00	01 21	00 00
	Increment		BE EF 03 06 00	97 82	04 00	01 21	00 00
	Decrement		BE EF 03 06 00	46 83	05 00	01 21	00 00
H.Size	Get		BE EF 03 06 00	B5 82	02 00	02 21	00 00
	Increment		BE EF 03 06 00	D3 82	04 00	02 21	00 00
	Decrement		BE EF 03 06 00	02 83	05 00	02 21	00 00
H.Phase	Get		BE EF 03 06 00	49 83	02 00	03 21	00 00
	Increment		BE EF 03 06 00	2F 83	04 00	03 21	00 00
	Decrement		BE EF 03 06 00	FE 82	05 00	03 21	00 00

Command data chart

Names	Operation type		Header	CRC	Command data		
					Action	Type	Setting code
Sharpness	Get		BE EF 03 06 00	F1 72	02 00	01 22	00 00
	Increment		BE EF 03 06 00	97 72	04 00	01 22	00 00
	Decrement		BE EF 03 06 00	46 73	05 00	01 22	00 00
Color	Get		BE EF 03 06 00	B5 72	02 00	02 22	00 00
	Increment		BE EF 03 06 00	D3 72	04 00	02 22	00 00
	Decrement		BE EF 03 06 00	02 73	05 00	02 22	00 00
Tint	Get		BE EF 03 06 00	49 73	02 00	03 22	00 00
	Increment		BE EF 03 06 00	2F 73	04 00	03 22	00 00
	Decrement		BE EF 03 06 00	FE 72	05 00	03 22	00 00
Video Format	Set	Auto	BE EF 03 06 00	9E 75	01 00	00 22	0A 00
		NTSC	BE EF 03 06 00	FE 71	01 00	00 22	04 00
		PAL	BE EF 03 06 00	6E 70	01 00	00 22	05 00
		SECAM	BE EF 03 06 00	6E 75	01 00	00 22	09 00
		NTSC 4.43	BE EF 03 06 00	5E 72	01 00	00 22	02 00
		M-PAL	BE EF 03 06 00	FE 74	01 00	00 22	08 00
		N-PAL	BE EF 03 06 00	0E 71	01 00	00 22	07 00
	Get		BE EF 03 06 00	0D 73	02 00	00 22	00 00
Video NR	Set	off	BE EF 03 06 00	B6 73	01 00	06 22	00 00
		on	BE EF 03 06 00	26 72	01 00	06 22	01 00
	Get		BE EF 03 06 00	85 73	02 00	06 22	00 00
Progressive	Set	off	BE EF 03 06 00	4A 72	01 00	07 22	00 00
		TV	BE EF 03 06 00	DA 73	01 00	07 22	01 00
		CINEMA	BE EF 03 06 00	2A 73	01 00	07 22	02 00
	Get		BE EF 03 06 00	79 72	02 00	07 22	00 00
Black	Set	off	BE EF 03 06 00	5E 71	01 00	08 22	00 00
		on	BE EF 03 06 00	CE 70	01 00	08 22	01 00
	Get		BE EF 03 06 00	6D 71	02 00	08 22	00 00
HDTV	Set	1080i	BE EF 03 06 00	F2 73	01 00	05 22	00 00
		1035i	BE EF 03 06 00	62 72	01 00	05 22	01 00
	Get		BE EF 03 06 00	C1 73	02 00	05 22	00 00
PinP Size	Set	off	BE EF 03 06 00	FE 22	01 00	00 23	00 00
		Large	BE EF 03 06 00	6E 23	01 00	00 23	01 00
		Small	BE EF 03 06 00	9E 23	01 00	00 23	02 00
	Get		BE EF 03 06 00	Cd 22	02 00	00 23	00 00

Command data chart

Names	Operation type		Header	CRC	Command data		
					Action	Type	Setting code
PinP Position	Set	Upper left	BE EF 03 06 00	02 23	01 00	01 23	00 00
		Upper right	BE EF 03 06 00	92 22	01 00	01 23	01 00
		bottom left	BE EF 03 06 00	62 22	01 00	01 23	03 00
		bottom right	BE EF 03 06 00	F2 23	01 00	01 23	02 00
	Get		BE EF 03 06 00	31 23	02 00	01 23	00 00
PinP Audio ch	Set	RGB	BE EF 03 06 00	BA 22	01 00	03 23	00 00
		Video	BE EF 03 06 00	2A 23	01 00	03 23	01 00
	Get		BE EF 03 06 00	89 22	02 00	03 23	00 00
FOCUS	Increment		BE EF 03 06 00	6A 93	04 00	00 24	00 00
	Decrement		BE EF 03 06 00	BB 92	05 00	00 24	00 00
Zoom	Increment		BE EF 03 06 00	96 92	04 00	01 24	00 00
	Decrement		BE EF 03 06 00	47 93	05 00	01 24	00 00
Sync on G	Set	off	BE EF 03 06 00	CB D0	01 00	08 30	01 00
		on	BE EF 03 06 00	5B D1	01 00	08 30	00 00
	Get		BE EF 03 06 00	68 D1	02 00	08 30	00 00

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